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IN THE

Supreme Court of the United States

OCTOBER TERM 1975

No. 75-865

DIAMOND INTERNATIONAL CORPORATION, *Petitioner*,

v.

MARYLAND PAPER BOX, INC., *Respondent*.

PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FOURTH CIRCUIT

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IN THE

Supreme Court of the United States

OCTOBER TERM 1975

No.

DIAMOND INTERNATIONAL CORPORATION, *Petitioner,*

v.

MARYLAND FRESH EGGS INC., *Respondent.*

PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FOURTH CIRCUIT

Petitioner, Diamond International Corporation (hereinafter "Diamond"), prays that a writ of certiorari issue to review the judgment herein of the United States Court of Appeals for the Fourth Circuit, entered in the above-entitled case, holding invalid Diamond's Reifers Patent No. 2,990,094 [reproduced as Appendix G, pages 149a-154a] (hereinafter the "094 patent").

Appendices A to F inclusive are presented herewith at the end of the Petition volume. Appendices G to Q inclusive are presented herewith in a separate larger volume to accommodate patent copies and photolithographs.

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OPINIONS BELOW

The opinion of the Court of Appeals is reported at 523 F.2d 113 (1975), and the text of it appears in Appendix A hereto, pages 1a-13a. The opinion of the District Court in this case [which was reversed by the Court of Appeals] is reported at 374 F.Supp. 1223 (1974), and the text of it is reproduced in Appendix C hereto 15a-69a. An earlier decision of the District Court (*Diamond International Corporation* v. *Walterhoefer*), holding the 094 patent valid and infringed, is reported at 289 F.Supp. 550 (1968), and its text is reproduced in Appendix D hereto 70a-140a. The decision of the Patent Office Board of Appeals, reversing the Examiner and allowing the 094 patent, is reproduced in Appendix E hereto 141a-146a.

JURISDICTION

The judgment of the United States Court of Appeals in the above-entitled case was entered on July 29, 1975. A petition for rehearing was denied on September 23, 1975; see Appendix B page 14a. Jurisdiction of this Court is invoked under 28 USC 1254 (1).

QUESTIONS PRESENTED

1. Has this Court's virtually monolithic pattern of granting certiorari to review decisions of patent *validity* while declining, except in very rare instances, to review decisions of patent *invalidity*, led courts of appeal to continue to make uncorrected fundamental errors in holding patents *invalid*?

2. Was a patent for a combination of elements which together produce a synergistic result (which had evaded those skilled in the art for many years) im-

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properly invalidated by the Court of Appeals because it considered only the novelty of the individual elements of the combination rather than applying the decisions of this Court such as *Lincoln*,[1] *A&P*,[2] and *Black Rock*,[3] which mandate an examination of the function or result of the combination?

3. Did the Court of Appeals, in utter disregard of the evidence, err in purportedly applying the principles of this Court's decision in *Graham* v. *John Deere*[4] to invalidate the 094 patent, which advanced the art as contemplated by the Constitution, while disregarding this Court's admonitions to examine and resolve not only the prior art and differences between it and the patent in issue *but also the level of skill in the pertinent art* and, in doing so, to guard against hindsight and resist the temptation to read into the prior art teachings of the invention in issue?

CONSTITUTIONAL PROVISION INVOLVED

Article I, Section 8, clause 8, of the United States Constitution reads in pertinent part as follows:

> "The Congress shall have Power * * *
> To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries; * * "

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[1] *Lincoln Engineering Co.* v. *Stewart-Warner Corp.*, 303 U.S. 545 (1938).

[2] *Great Atlantic & Pacific Tea Co.* v. *Supermarket Equipment Corp.*, 340 U.S. 147 (1950).

[3] *Anderson's-Black Rock, Inc.* v. *Pavement Salvage Co.*, 396 U.S. 57 (1969).

[4] *Graham* v. *John Deere*, 383 U.S. 1 (1966).

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STATUTORY PROVISIONS INVOLVED

The texts of Sections 101, 102 and 103 of 35 USC are reproduced in Appendix F hereto pages 147a-148a.

STATEMENT OF THE CASE

Petitioner brought suit against Respondent in the United States District Court for the District of Maryland, alleging infringement of the 094 patent by reason of Respondent's use and sale of molded foam polystyrene egg cartons which were manufactured and sold nationwide by Dolco Packaging Corporation (hereinafter "Dolco"). Jurisdiction was founded upon 28 USC § 1338(a)[5] and venue existed under 28 USC § 1400(b).[5a] Dolco undertook to save Respondent harmless in respect of such suit and openly and avowedly defended Respondent in the District Court and Court of Appeals.

With the advent of supermarkets in the 1930's (long prior to the Reifers invention), with their tremendous volumes of sale of staples such as eggs, it became necessary that eggs be sold in pre-packaged form and cartons made of paperboard (folded cardboard—not molded) were developed for this purpose. Sophisticated machinery was developed for filling and closing such cartons automatically and rapidly in large volume.

Although such paperboard egg cartons worked well in conjunction with such automatic machinery, and could be opened and reclosed by the consumer after purchase, they did not adequately cushion the eggs in

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[5] For text see Appendix F, page 147a.

[5a] For text see Appendix F, page 147a.

transit and during store-handling. Egg cartons molded from wood pulp had already been developed which solved the cushioning problem, but these were inadequate for other reasons, foremost of which was the lack of an adequate lock. These molded cartons could, by reason of the softness of the material of which they were made and the fact that the molding process lent itself to the design of form-fitting pockets for the eggs, minimize the breakage problem inherent in the paperboard carton.

The trouble with these molded pulp egg cartons was that for upwards of 20 years after they first became available, there was no satisfactory means of locking them rapidly in large volume by automatic machinery. The evidence at trial demonstrated that at least fifteen persons, skilled in the art, struggled with this problem unsuccessfully. Ultimately, one of these, Francis Hugh Sherman, invented and patented a so-called "TAB-LOCK". This lock consisted of two tabs downwardly dependent from the front side of the top section (cover) of the carton designed to be pushed into holes in the front side of the bottom section or tray portion of the carton *from the outside to the inside.*

Meanwhile, John Cox, a man who had spent most of his lengthy business life developing egg packaging equipment and egg cartons, and who had many patents in the field, developed a series of molded pulp egg cartons, the last of which was called the "CASE ACE", especially designed for cushioning of the eggs but all of which lacked any adequate latching means. One of these cartons,[5b] satisfactory in all respects ex-

[5b] Physical carton PX-92 illustrated in Cox 2,529,140, Appendix I, page 163a.

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cept for an adequate locking system, was developed and successfully tested in 1946.[6] In an effort to remedy the deficiency of lack of a latching means, Cox caused his cartons to be molded integrally with Sherman's TAB-LOCK and, although he was not satisfied with the locking means, finally offered the resulting product, the "CASE ACE", to egg packers. He also had designed and built automatic machinery to close and lock his CASE ACE TAB-LOCK cartons.

The CASE ACE TAB-LOCK carton suffered only indifferent success because the fingers on the automatic closing machines that pushed the tab locks into the holes in the egg retaining trays of the cartons had a tendency to break eggs in the front row. In addition, the tabs tore loose inhibiting relocking by the housewife. Cox was stymied, and so were the many other persons skilled in the art. The molded pulp carton was clearly the best means of pre-packaging eggs but without a latch that could be locked by automatic machinery, and then easily unlocked and relocked by the consumer, such cartons could not, as a practical matter, find much acceptance by high-volume automated egg packaging companies.

In 1951, after more than five years of unsuccessful efforts to develop a satisfactory lock for his molded cartons, Cox hired Richard F. Reifers, a package designer, to see if he could come up with a solution. Staples, clips and adhesives were not satisfactory. Locks which worked from the "outside in" locked the carton, but when automatically closed, caused intolerable egg breakage and were difficult to open (when locked), re-

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[6] See photo PX-94 dated 1946 on reverse side in Appendix J, pages 170a, 171a.

lock, and reopen. Locks intended to work from the "inside out" on a carton of soft material were not secure and would cause the eggs to spill out when the loaded carton was handled. Attempts to secure the lock intended to work from the "inside out" by exerting pressure from the fragile eggs were completely impractical, particularly when considered for automatic closing.

After several months of considering and trying various approaches, Reifers hit upon the idea of making use of the flexible front wall of the cover or top section, the partitions which before merely separated the eggs, and the hinged bracing flap extended from the lower or tray section which before merely braced the cover, *in a new way wherein the partitions acted in concert as part of his latching system.* Reifers formed latching holes in the flexible face of the front wall of the cover and molded projections or buttons on the outer side of the hinged bracing flap. Reifers discovered *the novel cooperation of the egg separating partitions with the button bearing bracing flap which in turn cooperated with the apertured flexible face of the cover front wall in such a manner that the Reifers carton locked securely when fully loaded, empty, or partially empty even though it was made of flexible material and the button bearing flap was hinged.* The Reifers carton could be successfully automated and easily opened and easily manually relocked.

Initial fears that the Reifers locking system was not secure enough were later proved unfounded. Neither the locking, which was virtually automatic, nor the unlocking, disturbed or had any tendency to break the eggs. Reifers applied for a patent (which ultimately issued as the 094 patent), and petitioner, for

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whom both Cox and Reifers worked, began tests to determine the practicality of the new carton, especially its ability to be closed rapidly and efficiently, without egg breakage, by automatic machinery.

Initially, there was skepticism (*U.S.* v. *Adams,* 383 US 39, 52) on the part of some of petitioner's engineering and manufacturing personnel as to whether Reifers' invention would really solve the automatic locking problem and prove better than the CASE ACE TAB-LOCK, but these doubts were soon resolved, and the Reifers carton became a commercial success to the extent that nowadays *virtually all eggs sold in supermarkets throughout the nation* are packed in cartons embodying the invention of Reifers' 094 patent.

As in the case of most commercially successful patented inventions that fill a long-felt want (the solution to which had evaded men skilled in the art for many years), there were infringements. Most of these were settled by the granting of licenses or the issuance of consent decrees, but one persisted and was resolved only after suit, a lengthy trial, a decision favorable to petitioner in the District Court for Maryland, holding the 094 patent valid and infringed, and an appeal to the Court of Appeals for the Fourth Circuit which was withdrawn when the infringing manufacturer, Packaging Corporation of America (a subsidiary of Tenneco), paid Petitioner $1,000,000 and took a license calling for a 3% royalty. This case was *Diamond International Corporation* v. *Walterhoefer,* 289 F.Supp. 550 (1968), the text of which is reproduced in Appendix D hereto pages 70a-140a.

After painstaking analysis, the District Court in *Walterhoefer,* concluded that Reifers had indeed discovered something, invented something and accom-

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plished something (which "something" Dolco, the infringing manufacturer of the carton here in suit, later characterized in advertising as "Revolutionary"). The Reifers patent was held valid and infringed.

In holding the 094 patent valid, the Court in *Walterhoefer* said inter alia (289 F.Supp. at 552-553, Appendix D pages 74a-75a):

> "In substance, he [Reifers] took the Cox '233 patent [Cox 2,771,233 filed in 1950 and covering Cox's CASE ACE carton], placed the male members (nobs, or lugs) on the flange hinged to the tray, the thrust of said male members being directed from the inside out, and inserted receiving notches (holes, female members) in the front wall of the cover portion. This permitted easy filling, by having the tray portion completely open, with the flange extended outwardly, and an easy closing by then pressing in the flange and rotating the cover over it. Upon release, the flange would spring outwardly, securely locking the cover; protecting the eggs; permitting release of the cover without harming the eggs, and also the opening, removal of some of the eggs, and manual reclosing. *Simple—beautifully simple; and so obvious in the view of 20-20 hindsight vision; and so completely missed previously by those 'skilled in the art.'*
>
> "Moreover, simplicity, far from being an objection to invention, 'may constitute its great excellence and value.' Chesapeake & Ohio Railway Co. v. Kaltenbach, 4 Cir. 1938, 95 F.2d 801, 804; ' * * * some of the simplest advances have been the most non-obvious.' Van Veen v. United States. Ct. Cl 1966, 151 USPQ 506; Webster Loom Company v. Higgins, 1882, 15 Otto 580, 105 U.S. 580, 591, 26 L.Ed. 1177; Eastern Rotocraft Corp. v. United States, Ct. Cl. 1966, 150 USPQ 124; Refractolite Corporation v. Prismo Holding Corporation, 2 Cir. 1941, 117 F.2d 806, 807; 'It only re-

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> mains now for the wisdom *which comes after the fact* to teach us that * * * [Reifers] discovered nothing, invented nothing, accomplished nothing.' (Carnegie Steel Co. v. Cambria Iron Co., 1901, 185 U.S. 403, 446, 22 S.Ct. 698, 715, 46 L.Ed. 968)." [Emphasis supplied.]

Several years later, Petitioner brought the instant suit alleging that the Dolco egg carton, which was made of molded foam polystyrene rather than molded wood pulp, infringed the 094 patent. After a lengthy trial, the same District Court as had decided *Walterhoefer* again held the 094 patent valid, and further held that the Dolco carton was an infringement because their molded foam polystyrene egg carton was the equivalent of the patented molded pulp carton and that the Reifers patent was not limited to wood pulp by its file history.

Respondent appealed the District Court's decision to the Court below which, in a very brief opinion which *disregarded all the evidence except a hindsighted view of the structure of the 094 invention* in comparison with the structure of the prior art, held the patent invalid for obviousness under 35 USC 103 contrary to the express statement of Section 103 that the invention is to be reviewed as of "the time the invention was made." It also held that the Reifers invention lacked novelty and that it was anticipated by the prior art within the meaning of 35 USC 101 and 102, although Respondent had abandoned these defenses in the District Court and had not raised them on the appeal.

Petitioner timely filed a petition for rehearing in the Court below which was denied on September 23, 1975, Appendix B page 14a.

REASONS FOR GRANTING THE WRIT

1. This Court's Virtually Monolithic Pattern of Granting Certiorari to Review Decisions of Patent *Validity* While Declining Except in Very Rare Instances, to Review Decisions of Patent *Invalidity*, Has Failed to Give the Lower Courts Guidance in the Factors Which Have Led to Erroneous *Invalidity* Holdings.

This Court recently granted certiorari in the case of *Sakraida* v. *AG Pro, Inc.*, No. 75-110, 96 Sup. Ct. 186 (1975), where the petitioner alleged that the decision of the United States Court of Appeals for the Fifth Circuit holding a patent directed to a combination of old elements *valid* is in conflict with decisions of this Court such as *Lincoln Engineering Co.* v. *Stewart-Warner Corp.*, 303 U.S. 545 (1938); *Great Atlantic & Pacific Tea Co.* v. *Supermarket Equipment Corp.*, 340 U.S. 147 (1950); and *Anderson's-Black Rock, Inc.* v. *Pavement Salvage Co.*, 396 U.S. 57 (1969).

Petitioner here contends that the decision of the United States Court of Appeals for the Fourth Circuit in this case is equally in conflict with those decisions because it held a patent *invalid* which did exhibit ". . . a new or different function . . . ,"[7] ". . . unusual or surprising consequences . . . ,"[8] and a ". . . synergistic result . . ."[9]

It is respectfully submitted that certiorari should be granted in this case to make it clear that the criteria of these prior decisions of this Court are not just negative requirements to be dredged up and utilized

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[7] *Lincoln* at 549.

[8] *A & P* at 152.

[9] *Black Rock* at 61.

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in order to invalidate patents, but are also positive requirements which must be examined in each case and which should lead to a holding of validity when satisfied as in the case at bar.

Petitioner submits that these most relevant criteria for judging the patentability of inventions have been erroneously used by lower courts only as a tool for striking down patents rather than as proper guideposts for establishing patent validity. Petitioner contends that this is a direct result of the nature of the cases this Court has chosen to review.

Over the last forty (40) years, when this Court has spoken in a patent case, it has spoken overwhelmingly in the same type of cases. Since *Lincoln,* this Court has only granted review of a court of appeals invalidity holding[10] five (5) times[11] and it has only reversed one[12] of those invalidity holdings. On the other hand, since *Lincoln,* this Court has reviewed twenty-four

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[10] Not counting situations where certiorari has been granted because of a conflict in decision of two circuits. There have been five (5) such conflict cases and in all this Court affirmed the invalidity holding. See *Graham* v. *John Deere Co.*, 383 U.S. 1 (1966); *Jungerson* v. *Ostby & Barton Co.*, 335 U.S. 560 (1949); *Maytag Co.* v. *Hurley Co.*, 307 U.S. 243 (1939); *Toledo Co.* v. *Standard Parts*, 307 U.S. 350 (1939); *General Elec. Co.* v. *Wabash Co.*, 304 U.S. 364 (1938).

[11] *General Elec. Co.* v. *Jewel Incandescent Lamp Co.*, 326 U.S. 242 (1945); *Dow Chem. Co.* v. *Halliburton Oil Co.*, 324 U.S. 320 (1945); *Automatic Devices Corp.* v. *Sirko Tool Co.*, 314 U.S. 94 (1941); *Standard Brands Co.* v. *Yeast Corp.*, 308 U.S. 34 (1939); *Crown Cork & Seal Co.* v. *Ferdinand Gutmann Co.*, 304 U.S. 159 (1938).

[12] *Crown Cork & Seal Co.* v. *Ferdinand Gutman Co.*, 304 U.S. 159 (1938).

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(24) cases [13] where a patent was held valid by a court of appeals and has reversed twenty (20) [14] of those validity holdings. *If one examines more recent history the sameness of the kind of case reviewed is even more pronounced.* Since *A & P,* this Court has reviewed only six (6) patent validity cases [15] and *all* of those were situations where the patent had been held valid

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[13] *Gottschalk* v. *Benson,* 409 U.S. 63 (1972); *Anderson's-Black Rock, Inc.* v. *Pavement Salvage Co.,* 396 U.S. 57 (1969); *United States* v. *Adams,* 383 U.S. 39 (1966); *Calmar, Inc.* v. *Cook Chem. Co.,* 383 U.S. 1 (1966); *Great Atlantic & Pacific Tea Co.* v. *Supermarket Equipment Corp.,* 340 U.S. 147 (1950); *Faulkner* v. *Gibbs,* 338 U.S. 267 (1949); *Graver Tank & Mfg. Co.* v. *Linde Air Products Co.,* 336 U.S. 271 (1949) aff'd on rehearing 339 U.S. 605 (1950); *Mandel Bros.* v. *Wallace,* 335 U.S. 291 (1948); *Funk Bros. Seed Co.* v. *Kalo Inoculant Co.,* 333 U.S. 127 (1948); *Halliburton Co.* v. *Walker,* 329 U.S. 1 (1946); *Sinclair & Carroll Co.* v. *Interchemical Corp.,* 325 U.S. 327 (1945); *Universal Oil Products Co.* v. *Globe Oil & Refining Co.,* 322 U.S. 471 (1944); *Goodyear Tire & Rubber Co.* v. *Ray-O-Vac Co.,* 321 U.S. 275 (1944); *Marconi Wireless Co.* v. *United States,* 320 U.S. 1 (1943); *United Carbon Co.* v. *Binney & Smith Co.,* 317 U.S. 228 (1942); *U.S. Industrial Chemicals, Inc.* v. *Carbide & Carbon Chemicals Corp.,* 315 U.S. 668 (1942); *Muncie Gear Works, Inc.* v. *Outboard, Marine & Mfg. Co.,* 315 U.S. 759 (1942); *Cuno Engineering Corp.* v. *Automatic Devices Corp.,* 314 U.S. 84 (1941); *Detrola Corp.* v. *Hazeltine Corp.,* 313 U.S. 259 (1941); *Electric Storage Battery Co.* v. *Shimadzu,* 307 U.S. 5 (1939); *Honolulu Oil Corp.* v. *Halliburton,* 306 U.S. 550 (1939); *Mackay Radio & Tel. Co.* v. *Radio Corp. of America,* 306 U.S. 86 (1939); *Gen. Talking Pictures Corp.* v. *Western Electric Co.,* 304 U.S. 175 aff'd on rehearing 305 U.S. 124 (1938); *Lincoln Eng'r Co.* v. *Stewart-Warner* Corp., 303 U.S. 545 (1938).

[14] All of the cases in note 13 except *United States* v. *Adams,* 383 U.S. 39 (1966); *Faulkner* v. *Gibbs,* 338 U.S. 267 (1949); *Goodyear Tire & Rubber Co.* v. *Ray-O-Vac Co.,* 321 U.S. 275 (1944); *General Talking Pictures Co.* v. *Western Electric Co.,* 304 U.S. 175 (1938).

[15] *Gottschalk* v. *Benson,* 409 U.S. 63 (1972); *Anderson's-Black Rock, Inc.* v. *Pavement Salvage Co.,* 396 U.S. 57 (1969); *United States* v. *Adams,* 383 U.S. 39 (1969); *Graham* v. *John Deere Co.,* (1966); *Great Atlantic & Pacific Tea Co.* v. *Supermarket Equipment Corp.,* 340 U.S. 147 (1950).

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by the Court of Appeals below, [16] and five (5) of those cases resulted in reversals and an ultimate holding of invalidity by this Court. [17]

The purpose of citing these statistics is not to demonstrate that this Court holds too many patents invalid. The ultimate holding is not the point.[18] What is important is that this Court's pattern of granting certiorari in patent cases has resulted in this Court almost always considering the same type of case, i.e., one where the patent has been held valid below. It is submitted that such a pattern of review results in the deciding of patent cases by this court from a distorted perspective. It is the distorted perspective which results from always approaching a problem from the same side. *This Court always considers the errors which lead a court of appeals to hold an invalid patent valid, but rarely exposes itself to the errors which lead a court of appeals to find a valid patent invalid.* Such errors have rarely been considered by this Court in the last forty (40) years, *have never been considered since the enactment of the 1952 Act,* and have only once been corrected, and that occured in 1938.[19] It is difficult to comprehend why courts of appeal are apparently deemed infallible when they hold patents *in-*

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[16] One involved a conflict between the circuits. *Graham* v. *John Deere Co.*, 383 U.S. 1, (1966).

[17] All but *United States* v. *Adams*, 383 U.S. 39 (1966).

[18] However, the fact that this court has only reversed one invalidity holding in forty years is further evidence of the sameness of the nature of this Court's review of patent cases discussed herein.

[19] *Crown Cork & Seal Co.* v. *Ferdinand Gutmann Co.*, 304 U.S. 159 (1938).

valid but in error, more often than not, when they hold them *valid*.[20]

It is respectfully submitted that this Court should start to balance its pattern of certiorari review in patent cases by granting certiorari to review the clearly erroneous invalidity holding of the United States Court of Appeals for the Fourth Circuit in this case.

2. The Court Below Has Decided a Federal Question in Conflict with Applicable Decisions of This Court, the Patent Statutes, and the Constitution.

As charged in the *Ag Pro* petition, some courts of appeal hold invalid patents valid because they fail to heed this Court's pronouncements in *Lincoln, A & P* and *Black Rock*. It is not as apparent, but nonetheless true, that many courts of appeal hold meritorious and valid patents invalid because of a failure to follow and adhere to the same principles, plus those enunciated by this Court in *Graham* v. *John Deere* and *U.S.* v. *Adams*. Unfortunately, because of this Court's one-sided certiorari policy, described above, this kind of court of appeals error has gone unchecked for many years.

The instant case is a particularly appropriate court of appeals holding of invalidity for this court to re-

[20] A side effect of this one-sided pattern of Supreme Court review of patent cases is to cloak courts of appeals' invalidity holdings with an unwarranted unspoken presumption of correctness. A court of appeals holding a patent invalid is not only unlikely to be reversed (only one has been in forty (40) years), but the chances have been extremely remote that its decision would even be reviewed. This pattern of review insures that a Court of Appeals need not fear making an error in favor of *invalidity*, since a holding of invalidity is not even likely to be reviewed, and the only danger of reversal a Court of Appeals need fear is when it holds a patent valid.

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view since the Court of Appeals completely ignored this Court's decisions in *Lincoln, A & P,* and *Black Rock,* and also in *Graham* v. *John Deere* [21] and *Adams.*[22] The Court of Appeals never considered the function or results of petitioner's unique combination of elements but only looked at the elements themselves. It believed it found these elements to exist in the prior art and without further examination held the patent invalid. It never took the indispensible next step of asking whether those elements cooperated to yield ". . . a new or different function . . . ," [23] or ". . . unusual or surprising consequences . . . ," [24] or ". . . a synergistic result . . .".[25]

The failure of the Court of Appeals to consider these factors [25a] is highlighted by the fact that in order to

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[21] *Graham* v. *John Deere* at 36.

[22] *U.S.* v. *Adams* at 52.

[23] *Lincoln* at p. 549.

[24] *A & P* at 152.

[25] *Black Rock* at 61.

[25a] By arrogating to itself the function of a patent examiner, looking solely at the prior art and the invention at hand with no guidance from factual evidence as to the level of skill in the art and the unsuccessful efforts of men skilled in the art to solve a pressing problem, the Court below has invalidated a patent which had been held unobvious by the Patent Office Board of Appeals (see Appendix E hereto pages 141a-146a) and valid by a District Court on two separate occasions after exhaustive study. *This patent advanced the art and benefited the public.*

The founding fathers recognized the public benefits from patents in framing Article I, Section 8 of the Constitution, leaving it to Congress to implement the concept by appropriate legislation. Congress, by enacting 35 USC 103, has made it clear that inventions falling short of a "flash of genius" should be patentable provided they are not obvious to men of ordinary skill in the art. This preserves and nurtures the Constitutional concept. But that concept is utterly frustrated if an appellate court may, by wholly disregarding evidence, hold obvious that which such evidence conclusively demonstrates to have been unobvious.

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invalidate petitioner's patent on an egg carton, the Court of Appeals could not rely on just egg carton art such as Cox [26] and Koppelman,[27] but had to rely on patents from different arts directed to devices which performed different functions. Thus, the Court of Appeals relied on Tuttle's packing box patent No. 117,-349,[28] Hooper's jewelry box patent, British Patent No. 406,159,[29] and Hunziker's cigarette case patent No. 1,354,042.[30] None of these patents were concerned with egg cartons and the unique problem of egg breakage and secure locking which had plagued the egg carton art for years before Reifers' invention. Reifers' synergistic result was being able to provide a molded egg carton which could be securely locked by automatic machinery without breaking the eggs. How is this surprising result foreshadowed by prior art dealing with cigarette and jewelry boxes where the problem of breakage of fragile contents such as eggs was nonexistent? Clearly it is not.

In each of the prior art patents relied upon by the Court of Appeals there are critical features which just do not function as they do in the Reifers' invention. Yet the Court of Appeals never considered the function of the elements it found to exist in the prior art but only the mere existence of those elements. For example, in Cox's cartons,[31] the structure of the egg cells performed

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[26] Cox 2,771,223—Appendix H,pp.155a-162.

[27] Koppelman 2,093,280—Appendix K,pp.172a-176a.

[28] Appendix M, pp.178a-179a.

[29] Appendix N, pp.180a-182a.

[30] Appendix O, pp. 183a-185a.

[31] Physical egg carton PX-92 illustrated in photo PX-94 dated 1946 on reverse side, Appendix J, pages 170a-171a, and Cox 2,529,140 filed 1947 reproduced in Appendix I, page 163a.

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only the function of holding and protecting the eggs, and the flap performed only the function of bracing the carton cover when closed. In Reifers' invention, the structure of the egg cells in the tray in relation to the hinge lines of the cover and flap, respectively, took on a wholly new function—that of stablizing the hinged locking flap so that when Reifers' buttons and holes were added, the synergistic result was the first successful molded, integral and nestable egg carton which could be locked by fast-running automatic equipment without disturbing the eggs, and which could be easily opened, locked and relocked by hand.

The button-and-hole prior art cited by respondent and relied upon by the Court below consisted primarily of the Koppelman patent No. 2,093,280 [32] which depicted a molded pulp egg carton with buttons and holes, and secondarily of patents describing button and hole latches *without hinged flaps* utilized on vari-

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[32] The Court below [Appendix A page 12a] improperly concluded that Koppelman "may be considered as anticipation" of Reifers (also see p. 2a and p. 11a, footnote 5). Section 102 requires *identical* disclosure, since otherwise there is no necessity for § 103 which states that a "patent may not be obtained though the invention is not *identically* disclosed or described as set forth in § 102 . . ."

The Court below in its opinion [Appendix A page 5a] erroneously stated that novelty of the Reifers invention is "denied by appellant-defendant . . .". Respondent during the course of this appeal never denied novelty.

The Appellate Court's decision in this case, if left to stand, would create an improper precedent for the definition of "anticipation" and do away with the distinction between §§ 102 and 103. The Appellate Court's definition of "anticipation" improperly renders § 103 entirely superfluous. By its express terms § 103 applies to cases in which the subject matter "is not identically disclosed . . . as set forth in § 102." When there is no identical disclosure, there can be no anticipation.

ous boxes made of relatively non-flexible material. John Cox, one of the most important of the persons skilled in the art, had actual knowledge of the Koppelman patent. It described a molded pulp egg carton without tying partitions and an unstable flap with buttons on it, attached to the top member of the carton. These buttons were supposed to engage holes in the lower member of the carton, but there was nothing to keep the buttons from popping out (so that the carton would open up and the eggs fall out) except the eggs themselves bearing against the flap, after it was in place. Cox testified that the Koppelman carton was wholly impractical because, among other things, to lock it by automatic machinery after the eggs were in place would involve trying to push the flap, with its buttons, down between the eggs and the inside of the front of the carton, which could hardly be done without breaking the eggs. A purported replica [33] of that carton became an exhibit in the instant case, and it became apparent that, without the eggs bearing against the flap in the manner taught by the patent, it would not even close, much less lock.

In view of its utter impracticality, the Koppelman patent not only did not make the use of buttons and holes for the locking of egg cartons obvious, but rather steered those skilled in the art away from that concept in their search for a satisfactory automatably lockable egg carton (*U.S.* v. *Adams,* 383 US 39, 52).

The other so-called "latch" patents were more far afield than Koppelman and would not have suggested Reifers' invention to the persons skilled in the art

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[33] See physical DX-94 [photo of DX-94 is in Appendix L, page 177a].

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because the impracticability of Koppelman's carton had already steered them away from any button-and-hole approach to their problem. Without Reifers' unique combination,[34] utilizing the tying partitions of Cox's cartons *to accomplish a new purpose, i.e., stabilizing the button bearing hinged locking flap, buttons and holes simply would not work* on an otherwise relatively soft and flexible molded carton suitable for eggs. This fact was demonstrated during the trial by an experiment conducted for respondent by Dolco at the latter's egg carton manufacturing plant at Lawrenceville, Georgia. Dolco had constructed a rectangular box in the shape of an egg carton [35] but *without integral tying partitions.* It had a button bearing flap hinged to its bottom portion and corresponding holes punched in the front side of its lid. Attempts to close and lock this carton by running it through the same automatic closing machinery as is used successfully to close and lock the Reifers carton resulted in failure.

A further reason why the rigid box prior art would not have suggested Reifers' invention to the men skilled in the art is that the buttons on those boxes were relatively rigidly mounted, i.e., were directly on the bottom of the box rather than on a hinged flap. This construction is not satisfactory in egg cartons, as is shown by the following quotation from Snow

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[34] The U.S. Patent Office had before it the best prior art including Cox No. 2,771,223 (Appendix H pages 155a-162a) and Koppelman No. 2,093,280 (Appendix K pages 172a-176a). The decision of the Patent Office Board of Appeals, (Appendix E 141a-146a) authored by Hyman Freehof, the very examiner who had years previously allowed the Koppelman patent, recognized the attributes of the Reifers invention. See page 146a.

[35] Physical egg carton DX-11 and DX-12, see photo in Appendix P, page 186a.

patent No. 3,398,875,[36] under which Dolco is licensed (Col. 1, lines 51-59):

> "When molded from pulp or a plastic of about the same stiffness as pulp, *no satisfactory connection directly between the carton bottoms and the covers is practicable.* For that reason, locking flaps are used and considerable effort has been directed to the prevention of their becoming disengaged from the covers incidental to the handling and transportation of the cartons." (Emphasis supplied.)

The above statements were made by Snow in his 1966 patent application, *ante litem motam,* and show that button and hole latches on rigid, non-egg-carrying boxes as depicted in the prior art patents considered by the Court below, would not (particularly in light of the impracticality of Koppelman's button-and-hole egg carton) have made Reifers' invention obvious to the men skilled in the art.

While the Court below did examine the scope and content of the prior art and observed the differences between the prior art and the patent claim at issue, as directed by this Court in *Graham* v. *John Deere, it wholly ignored this Court's admonition in that case* that "the level of ordinary skill in the pertinent art [be] resolved."

Nowhere in the opinion of the Court below is there any mention, much less evaluation, of the voluminous uncontradicted evidence relating to the skill in the art of John Crane, Francis Hugh Sherman, Morris Koppelman, Ralph A. Farnham, Robert E. Read, William J. DeReamer, George W. Swift, Ruth M. Schilling, Walter J. Schwertfeger, Walter H. Randall, Merle

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[36] PX-30 reproduced in Appendix Q, pages 187a-192a.

Chaplin, Harold Crane, Lile H. Brown, Alfred Irwin Comstock and (perhaps most importantly) John Cox. All of these men were skilled in the art; all of them had access to the prior art and many of them had actual knowledge of the two items of prior art most heavily relied upon by the Court below—Koppelman Patent No. 2,093,280,[4] issued in 1937, and Cox Patent No. 2,771,233,[5] issued in 1956 on a 1950 application. None of them thought of doing what Reifers did. The "obviousness" of Reifers' invention became apparent only after Reifers invented it. All of these facts, however, were wholly ignored by the Court below, to whom the invention appeared "obvious" after they had seen it with what the District Court in *Walterhoefer* called "20-20 hindsight vision."

In short, the Court of Appeals examined the prior art simply for structure and failed to examine the function of that structure. It failed to examine the function of that structure because it ignored the decisions of this Court which mandate a consideration of function as well as structure. By granting certiorari to review the Court of Appeals' holding of invalidity, this Court can make it clear that invalidity as well as validity holdings of the court of appeals will be scrutinized by this Court and subjected to identical principles. The prior pronouncements of this Court in *Lincoln, A & P* and *Black Rock* are not to be used only to invalidate patents but together with the pronouncements of *Graham* v. *Deere* and *Adams* must also be applied to uphold patents which have been erroneously invalidated in ignorance of those pronouncements.

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CONCLUSION

For the reasons aforesaid, it is respectfully prayed that a writ of certiorari be granted to review the judgment of the United States Court of Appeals for the Fourth Circuit.

Respectfully submitted,

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Certificate of Service

Service of the foregoing "Petition for Writ of Certiorari" was made on respondent by mailing three copies thereof, first class postage prepaid on December 22, 1975, to Herbert C. Brinkman, Esq. and Richard H. Evans, Esq., c/o Wood, Herron & Evans, 2700 Carew Tower, Cincinnati, Ohio 45202.

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APPENDIX

Note:

APPENDICES "A" - "F", pages 1a-148a, are in this volume

APPENDICES "G" - "Q", pages 149a-192a are in separate larger volume including patent copies and photos

APPENDIX A

UNITED STATES COURT OF APPEALS
FOR THE FOURTH CIRCUIT

No. 74-2104

DIAMOND INTERNATIONAL CORPORATION,
a corporation of Delaware, *Appellee*,

v.

MARYLAND FRESH EGGS, INC.,
a corporation of Maryland, *Appellant*.

Appeal from the United States District Court for the District of Maryland, at Baltimore. R. Dorsey Watkins, District Judge.

(Argued March 7, 1975 Decided July 29, 1975)

Before BRYAN, Senior Circuit Judge, FIELD, Circuit Judge and HALL, District Judge.

BRYAN, Senior Circuit Judge:

The subjects of this patent litigation are a 12-egg carton made of molded pulp and a like-shaped and purposed container made of foam polystyrene (plastic). As the assignee-owner of the patent covering the pulp carton, No. 2,990,-094 issued June 27, 1961 to one Reifers (original applica-

tion filed 1952), appellee Diamond International Corporation charged appellant Maryland Fresh Eggs, Inc. (MFE) with infringing its patent after notice thereof, by selling plastic cartons embodying the invention delineated in these letters patent and purchased from a manufacturer other than Diamond.[1] Concluding the patent to be invalid as lacking in novelty because anticipated in the prior art, 35 USC 101 and 102(a),[2] and lacking invention because of obviousness, 35 USC 103,[3] we reverse the District Court's judgment upholding the patent, Diamond International Corp. v. Maryland Fresh Eggs, Inc., 374 FS 1223 (D.C. Md. 1974).[4] We have no occasion, therefore, to look to in-

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[1] This manufacturer was Dolco Packaging Corporation, of Delaware, which as the real party in interest is defending this suit for MFE pursuant to an agreement to save the latter harmless from the instant claim of Diamond. Dolco's product derived from the Snow Patent No. 3,398,875 (1968).

[2] § 101: "Inventions patentable.

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title."

§ 102(a): "A person shall be entitled to a patent unless—

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent . . . ."

[3] § 103: "A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made."

[4] The only claim in suit is No. 1, and for ready reference it is now quoted in full:

"What is claimed is:

1. In an integral and nestable egg carton made of relatively

fringement. Agrashell, Inc. v. Hammons Products Company, 413 F2d 89, 93 (8 Cir. 1969).

---

flexible molded pulp, a cellular tray portion having a front side, a rear side, and two ends, an inverted dished cover hinged to said tray portion, means for latching said tray portion to said cover with a latch located above said tray portion and extending completely through said cover from the inside to the outside, said tray portion having its front side strongly tied to its rear side by a plurality of spaced cell-forming partitions extending generally parallel to said tray portion ends, said partitions acting as means for preventing spreading of said front side from said rear side, said tray portion including egg cells adjacent but below the latching means, said inverted dished cover having a planar top, a front side, a rear side, and two ends, said front side being connected to said rear side only by said two ends and said planar top so that the front side is relatively flexible and is not rigidly tied to said rear side intermediate the ends of said front side, said front side of said cover having an opening formed therein through which the latch is adapted to extend completely from the inside to the outside, said dished cover being hinged to said tray portion along its rear side, a latch holding flap hinged to the front side of said tray portion, the hinge line connection of said cover with said tray portion and the hinge line connection of said latching flap with said tray portion being maintained parallel by said tying partitions even when the tray portion is loaded with eggs, said latch on said latching flap being located on one side of said tray portion which is opposite to the side where the cover is connected to the tray portion so that both the cover and the latching flap are each connected to the tray portion when the carton is open, said molded pulp egg carton being integrally formed with the latching flap, the uper edges of the two sides and the two ends of the tray portion, the upper edges of the two sides and two ends of the cover generally in the same plane and with the latch extending downwardly from the underside of the latching flap which is hinged to the front side of the tray portion and said latch being relatively close to the tray portion as compared with the opening in the front side of the cover which is relatively remote from the tray portion; when the tray portion is loaded with eggs and the latching flap is turned upwardly and the cover portion is rotated in a direction to telescope over the latching flap, the two hinge lines are relatively immovable but the front side of the cover may flex, whereby the loaded egg carton may be latched by simply rotating the latching flap upwardly and inwardly and rotating the

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Besides the patent drawing (see p. 5a infra), a lay description of the carton is now offered with the hope of conveying at once a general understanding of the device in controversy. It consists of an oblong tray with an inverted dished cover or lid, hinged lengthwise along the top of the rear side of the tray; the tray is divided into 12 cellular sections each to hold a single egg, with six sections in the front row and six in the row behind it (known as the 2×6 carton); extending along, upwards from, and hinged on the front edge of the tray is a flap or flange on which are two lugs or buttons projecting outwardly; the front or unhinged side of the cover has two small holes or apertures of a diameter approximating that of the lugs on the flange of the tray; as the cover is brought down, using the hinge on the rear side of the tray, the holes in the cover easily slip over the lugs, since the holes and the lugs are positioned to engage each other; this locks the cover and the tray together and thereby forms the latch constituting a principal feature of the inventiveness asserted for the patent; the other feature is the "plurality of spaced cell-forming partitions extending generally parallel to the said tray portion ends"—tying partitions—preventing the spreading of the front from the rear side of the carton and thus stabilizing the locking flap.

This is a product patent, embracing a combination of old elements with "improvements in a molded pulp egg carton and particularly to its integral means to releasably lock together the cover and bottom sections of the carton"—to quote from the first sentence of the specifications. Its util-

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cover upwardly and around the latching flap while the structural features maintain the geometric relation of the latch on the latching flap to the opening in the cover until the front side of the cover engages the latch on the latching flap and is cammed thereover until the latch on the latching flap registers with the opening in the front side of the cover whereupon the latch passes through the opening in the cover from the inside to the outside to effectively latch the carton."

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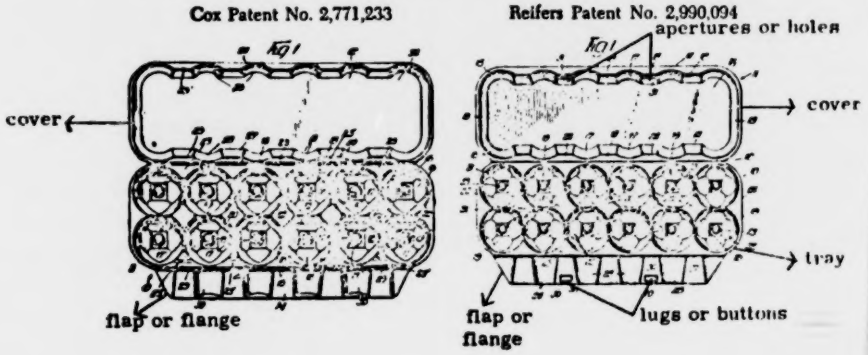
ity is conceded but its novelty denied by appellant-defendant, 35 USC 101 and 102(a) supra. Additionally, MFE asserts that its accused carton is not within the specifications and the claim of Reifers' (appellee Diamond-owned) patent because the latter is limited to a molded pulp carton, while MFE's is a plastic carton. In replication Diamond urges that the plastic is an equivalent of the molded pulp carton, and consequently is not within the Reifers' patent coverage. However, we find it unnecessary to resolve this challenge since our view is that the patent fails for anticipation and obviousness.

Our holding observes the lesson of Graham v. John Deere Co., 383 US 1, 17 (1966) for the ascertainment of obviousness:

> "While the ultimate question of patent validity is one of law, *A. & P. Tea Co.* v. *Supermarket Corp., supra,* at 155, the § 103 condition, which is but one of three conditions, each of which must be satisfied, lends itself to several basic factual inquiries. Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved."

The Prior Art

To begin with, concededly the Reifers' carton was built upon the Cox Patent No. 2,771,233 (1956, issued on 1950 application), known as the Case Ace carton (see juxtaposed drawings of the two on p. 5a) [below]. Although Cox pro-



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vided no latching between the tray and the cover, otherwise the form of the two products is not dissimilar. In its pretrial order the District Court finds that "the *only structural differences* between the carton shown in the Reifers' patent in suit and the carton shown in the Cox '233 patent is the locking feature." (Accent added.) Moreover, Reifers was employed by Cox to put a latch on Cox's carton. Instead of a latch to keep the tray and cover together, Cox relied upon the friction between the front of the cover and the flap along the edge of the tray when the cover is hinged down over it. Thus plainly Reifers was anticipated by Cox in the configuration of the carton.

As to the Reifers' lock, it is apt to emphasize that Cox, like Reifers, provided a flap or flange along the top of the front wall of the tray and fitting under the front of the cover when the carton is closed. As confirmed by the drawings of Cox and Reifers, to supply the latch Reifers merely added to Cox two holes in the cover and two buttons on the flap. This type of latching as patentee Reifers stated in a letter to Cox, was anticipated by use years before.

Convincing of this are the earlier uses of the lug-in-hole locking found on containers *other than egg cartons*. Unlike the trial court we think these are apposite because it is the principle of the latch, not its vehicle of application, which is enlightening. Graham v. John Deere Co. (Calmar, Inc. v. Cook Chemical Co.), supra, 383 US 1, 35. To be stressed in this review of carton history is that the focal point is the latch, for only the latch is now in issue. The conformation of the Reifers' carton—including its partitions and reinforcing ties—indisputably is that of the Cox '233 Case Ace, and so was anticipated by the latter.

Tuttle Patent No. 117,349 (1871) embodied an improved pasteboard packing box. It included projections placed on the box to extend through holes on the lid, as illustrated on p. 7a [opposite]. The patent describes the conception as follows:

Case A.

John W. Tuttle's

Imp. Packing Box.

117349

PATENTED JUL 25 1871

Fig 1

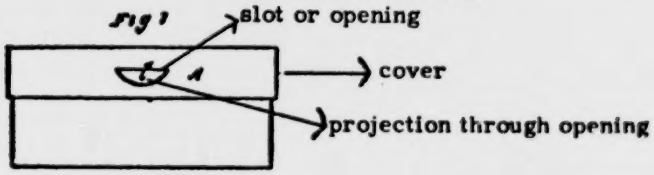


Fig. 2.

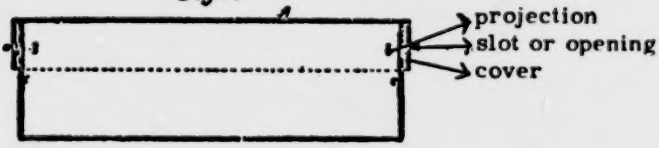


Fig. 3

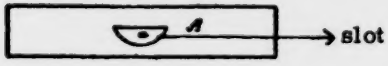
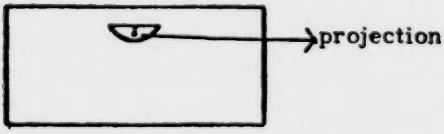


Fig 4.



Witnesses
L. N. Pfau
L. N. Miller

John W. Tuttle
by his attorneys
R. H. Eaton

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"What I claim as my present invention is—

"The improved pasteboard packing-box, as provided with slots arranged through the sides or ends of its cover, as described, and with corresponding projections to enter such, arranged and formed on or from the body, as set forth."

Hooper British Patent No. 406,159 (1934), its drawing reproduced on p. 9a [opposite], exhibits a box consisting of a tray and a hinged lid with a button and hole latch. The unit is described as:

"The side 8 of the lid 2 opposite to the hinge 3 is provided with a recess 9 which, when the box is closed, is sprung over the projecting head 7 so that the box is retained closed."

* * *

"3. A moulded box or case according to Claim 2 wherein the tongue or the loke is formed on a thickened portion of the wall of the body of the box and the catch or projection is engageable resiliently with a recess formed in the interior of the lid.

"4. A molded box or case according to Claim 1 or 3 wherein the projection comprises the head of a rivet secured in a hold in said resilient tongue."

Hunziker Patent No. 1,354,042 (1920) (see p. 10a) devises a cigarette case, made up of a tray, a lid, a flange forming the tray's front wall, a boss or lug on the flange and a notch or hole on the lid passing over the lug in the closed position. These are the related words of the patent:

"The edge flange 8 is formed with a notch 10, and the offset portion 9a of the edge flange 9 has an outwardly pressed boss 11 that is beveled on its upper side and terminates in a sharp shoulder. When the case is closed, the boss or lug 11 will cam itself into interlocking engagement with the notch 10, and to release

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406,159 COMPLETE SPECIFICATION 1 SHEET

HOOPER, BRITISH PATENT NO. 406,159

FIG.1.

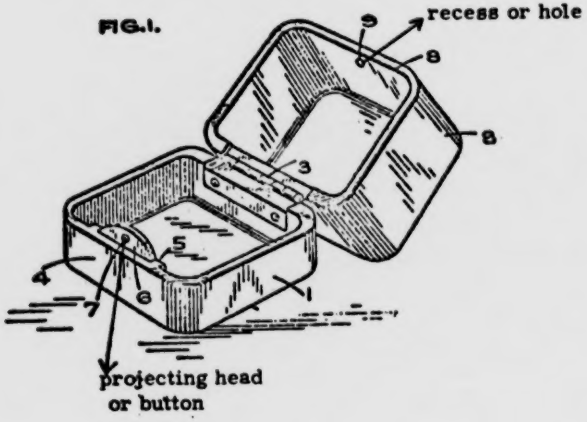


FIG.2.

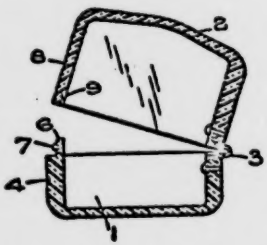
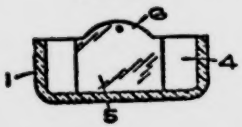


FIG.3.



[This Drawing is a reproduction of the Original on a reduced scale.]

DX 87 Tab 26

Malby & Sons, Photo-Litho.

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B. F. HUNZIKER.
CIGARETTE CASE.
APPLICATION FILED MAR. 8, 1920.

1,354,042. Patented Sept. 28, 1920.

Fig. 1

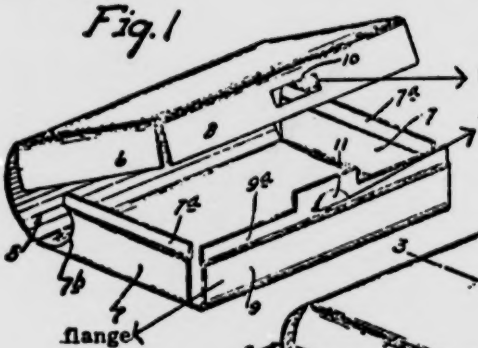


Fig. 2

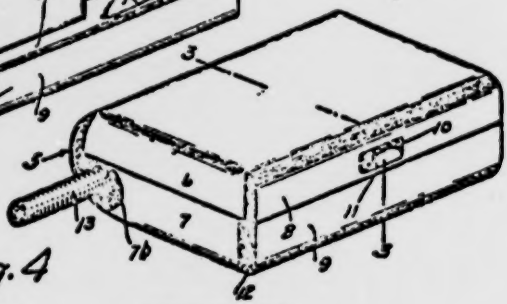


Fig. 4

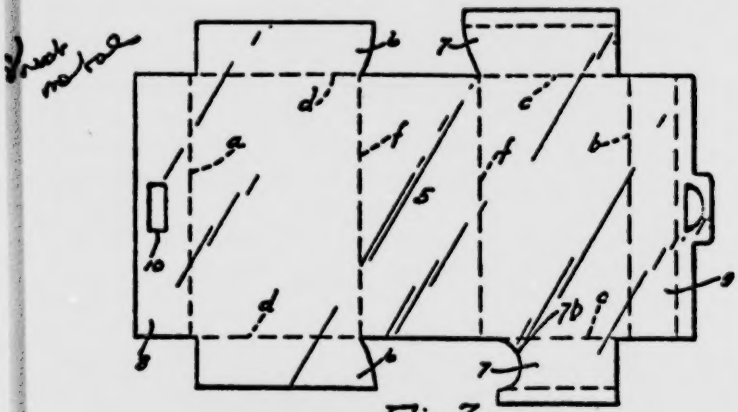
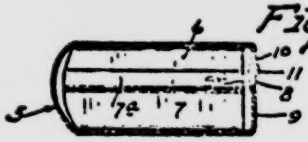


Fig. 3



INVENTOR
Benjamin F. Hunziker
BY HIS ATTORNEYS
Williamson & Merchant

Y PRINTED CLOSE TO EDGE

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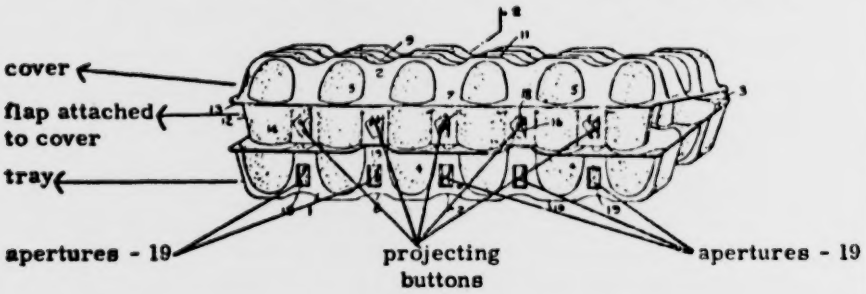
the same from the said notch when it is desired to open the case, the flange 9 must be sprung inward by pressure from the fingers."

When considered with these products, a pertinent reference to the art prior is Koppelman No. 2,093,280 (September 14, 1937),[5] copied on p. 11a [below]. It consists of a tray



compartmentalized to provide pockets for eggs; a cover hinged on the rear side of the tray; a flap on the outer edge of the forward or front wall of the *cover* (the Reifers' flange is hinged to the bottom tray); lugs on the flap or flange (as in Reifers); and apertures or holes in the front wall of the *tray* (the Reifers' holes are in the cover). As the cover is brought over and upon the tray the flap moves down into the tray, just inside the front wall of the tray. Thereupon the lugs or buttons fit into the apertures in the front wall of the tray. The eggs in the front row press against the flap, aiding the maintenance of the lugs or buttons in the apertures in the front wall of the tray.

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[5] The District Judge (374 FS 1227) commented that defendant-appellant's counsel had admitted in argument "that Koppelman was not an anticipation". Our interpretation of his colloquy with the Court is that the attorney was conceding that Koppelman was not identical with Reifers and that without association with the other alleged prior art specimens it would not amount to anticipation.

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True, the position of the lugs and the holes are in an arrangement in reverse of Reifers—with the lugs on the cover and holes in the tray—but the employment of lugs and holes in this environment at once suggests the Reifers' latch. Even if Koppelman had never been made commercially, as appellee Diamond asserts, it may be considered as anticipation. Dashiell v. Grosvenor, 162 US 425, 432 (1896).

Obviousness

While this array of prior art, we think, destroys the idea of novelty or invention in Reifers under §§ 35 USC 101 and 102(a), a complete appraisal of the Reifers' patent requires its evaluation under § 35 USC 103 for obviousness. To us the same array simultaneously also proves this infirmity. It is presently academic whether novelty and obviousness are questions of fact or of law for in either event we think that on these issues the findings of the District Court on the facts are clearly erroneous and its conclusions on the law cannot stand.

We see Reifers as only an adaptation of the button and button-hole principle. It is transparently existent in Reifers' improvement of the Cox carton, for Reifers simply put two clasps of this design on Cox. Repeatedly does it appear in the non-egg uses just considered as well as in Koppelman. From his experience and awareness of the history of this locking contrivance the "person having ordinary skill in the art," 35 USC 103(a), would recognize this bonding mechanism in Reifers.

This is true even in regard to Koppelman's reversal of the fastening elements. The statutory-skilled person would quickly grasp the similitude of the Reifers and Koppelman latches, since to arrive at the Reifers' concept would only require the transfer of the flap from the cover to the tray and the holes from the tray to the cover. (See drawing on p. 11a [*supra*].

Incidental Considerations

The evidence is greater than a mere preponderance and squarely rebuts the presumption of patent validity accorded by 35 USC 282. Stukenborg v. Teledyne, Inc., 441 F2d 1069, 1072 (9 Cir. 1971), cert. denied 404 US 852. Its force and clarity overshadows the effect of long-felt want, licenses, commercial success, and other secondary factors in adjudging patentability.

In fine, continuing obedient to the precepts of Graham v. John Deere, supra, 383 US 1 (1966), we are required to reverse, at no moment, however, losing sight of the intense study, thought and industry of the District Judge.

REVERSED.

APPENDIX B

[Filed Sept. 23, 1975]

UNITED STATES COURT OF APPEALS
FOR THE FOURTH CIRCUIT

No. 74-2104

DIAMOND INTERNATIONAL CORPORATION, *Appellee*,

v.

MARYLAND FRESH EGGS, INC., *Appellant*.

Appeal from the United States District Court for the District of Maryland, at Baltimore. R. Dorsey Watkins, District Judge.

Order Denying Rehearing

Upon consideration of the petition of appellee, Diamond International Corporation, for a rehearing, with the suggestion for a rehearing in banc, and no request for a poll of the entire court having been made as provided by Rule 35(b) Federal Rules of Appellate Procedure, and a hearing or rehearing before the court in banc not having been ordered by a majority of the circuit judges of the circuit who are in regular service as provided in 28 United States Code 46,

THEREFORE, with the concurrence and approval of Judges Field and Hall, the other members of the hearing panel, it is

ADJUDGED and ORDERED that the said petition for rehearing be, and it is hereby, denied.

For the Court:

/s/ ALBERT W. BRYAN
Albert W. Bryan
Senior United States Circuit Judge

APPENDIX C

UNITED STATES DISTRICT COURT,
D. MARYLAND

April 25, 1974.

Civ. A. No. 20809.

DIAMOND INTERNATIONAL CORPORATION,
a corporation of Delaware,

v.

MARYLAND FRESH EGGS, INC.,
a corporation of Maryland.

WATKINS, Senior District Judge.

This is an action brought by Diamond International Corporation (hereinafter sometimes "Diamond" or "Plaintiff") against Maryland Fresh Eggs, Inc. (hereinafter sometimes "MFE" or "Defendant") for alleged infringement of United States Patent 2,990,094 (Reifers '094) issued June 27, 1961, on a continuation of a copending application filed December 16, 1953, which was in turn a continuation-in-part of an application filed May 24, 1952, for a "Molded Pulp Egg Carton." It is a product patent.

The Patent Office has determined that Reifers '094 is entitled to the filing date of May 24, 1952.

Dolco Packaging Corporation (hereinafter sometimes "Dolco") by agreement dated June 26, 1969, undertook to save MFE harmless with respect to Diamond's claim in this action; its defense is open and avowed; and it has engaged and is paying the (very able) attorneys who are defending MFE.[1] It is jointly owned by Olson Brothers, Inc. (hereinafter sometimes "Olson") and Dow Chemical

[1] Pretrial Order (hereinafter P/T) filed March 23, 1971, par. 4.

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Company (hereinafter sometimes "Dow"), neither of which is a party to this suit.[2]

Jurisdiction and venue are admitted and were established.

In Diamond International Corporation v. Walterhoefer, 289 F.Supp. 550 (D. Md. 1968) (hereinafter "Walterhoefer"), the author of this opinion held Reifers '094 to be valid and infringed.[3] No appeal was effected to the United States Court of Appeals for the Fourth Circuit.

Plaintiff, of course, contends that the *Walterhoefer* decision is controlling. Defendant (equally), of course, contends that it is not. In general, Defendant urges that the decision in *Walterhoefer* was probably wrong, but that even if it were not, subsequently developed additional information, including additional patents; later decisions with respect to combination patents and fraud on the Patent Office; and the physical and geometrical properties of the accused structure should now lead to a different result. Alternatively, Defendant contends that Reifers '094, if valid, is so limited that it does not read on the accused device. Plaintiff counters that the accused device is the equivalent of that claimed in Reifers '094.

This litigation also has been vigorously contested.[4]

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[2] P/T, par. 21. Olson and Dow were originally joined as defendants. Dow's motion to dismiss was granted, and the Olson litigation was transferred.

[3] Since Walterhoefer was thoroughly litigated (See 289 F.Supp. at 551, footnote 1) frequent refernces will be made thereto, with some quotations therefrom.

[4] In addition to the usual pre-trial and pre-trial conferences and orders, all preceded by voluminous briefs and fully argued, there was a trial of thirteen court days; two days were spent visiting the plants of Plaintiff and Defendant, and half day in an abortive effort to visit a packaging plant; one day on Plaintiff's motion to reopen the case; and a full day on final argument. In the trial a total of 235 Plaintiff's exhibits and 158 Defendant's exhibits were

The claim in suit read as follows:

"1. In an integral and nestable egg carton made of relatively flexible molded pulp, a cellular tray portion having a front side, a rear side and two ends, an inverted dished cover hinged to said tray portion, means for latching said tray portion to said cover with a latch located above said tray portion and extending completely through said cover from the inside to the outside, said tray portion having its front side strongly tied to its rear side by a plurality of spaced cell-forming partitions extending generally parallel to said tray portion ends, said partitions acting as means for preventing spreading of said front side from said rear side, said tray portion including egg cells adjacent but below the latching means, said inverted dished cover having a planar top, a front side, a rear side, and two ends, said front side being connected to said rear side only by said two ends and said planar top so that the front side is relatively flexible and is not rigidly tied to said rear side intermediate the ends of said front side through which the latch is adapted to extend completely from the inside to the outside, said dished cover being hinged to tray portion along its rear side, a latch holding flap hinged to the front side of said tray portion, the hinge line connection of said cover with said tray portion and the hinge line connection of said latching flap with said tray partitions even when the tray portion is loaded with eggs, said latch on said latching flap being located on one side of said tray portion which is opposite to the side where the cover is connected to the tray portion so that both the cover and

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filed; and after the trial, briefs of over 800 pages were filed, taking only Foreword and Text. If the instances in which a numbered page was faced by an unnumbered page, and if the appendices, were added, the total would well exceed 1000 pages.

the latching flap are each connected to the tray portion when the carton is open, said molded pulp egg being integrally formed with the latching flap, the upper edges of the two sides and the two ends of the tray portion, the upper edges of the two sides and two ends of the cover generally in the same plane and with the latch extending downwardly from the underside of the latching flap which is hinged to the front side of the tray portion and said latch being relatively close to the tray portion as compared with the opening in the front side of the cover which is relatively remote from the tray portion; when the tray portion is loaded with eggs and the latching flap is turned upwardly and the cover portion is rotated in a direction to telescope over the latching flap, the two hingelines are relatively immovable but the front side of the cover may flex, whereby the loaded egg carton may be latched by simply rotating the latching flap upwardly and inwardly and rotating the cover upwardly and around the latching flap while the structural features maintain the geometric relation of the latch on the latching flap to the opening in the cover until the front side of the cover engages the latch on the latching flap and is cammed thereover until the latch on the latching flap registers with the opening in the front side of the cover whereupon the latch passes through the opening in the cover from the inside to the outside to effectively latch the carton.

"2. A nestable molded pulp egg carton in accordance with Claim 1, wherein the opening in the front side wall of said cover extends to the planar portion thereof and the latch on said latching flap is near the edge thereof which is remote from the hinge connection of the latching flap with the tray portion."

Formation of Cartons

Plaintiff's cartons are integrally [5] produced by a process of secretion of liberated wood or waste paper fibers, by suction imposed within a die of desired configuration, upon the exterior of the die. Defendant's cartons are [6] of foamed polystyrene. The process begins with solid polystyrene in bead form. The beads are thermoplastic, and become a fluid consistency as heat is applied externally to an extruder. A gas (Freon) under high pressure is charged into the molten polystyrene in the extruder and diffuses into the polystyrene. Subsequently, the mass is partially cooled under the maintained pressure, and the mass is squeezed or extruded continuously out of a narrow circular annulus into the atmosphere in the form of a tube.

Upon release of pressure on extrusion, the diffused gas, aided by the prior incorporation of a nucleating agent, forms a myriad of tiny bubbles in the tube.

The tube passes over a cooled mandrel which expands the diameter of the tube and coincidentally causes the tube material to be stretched circumferentially, building what is called transverse axial orientation into the material and strengthening it. Coincidentally the tube is subjected to longitudinal stretch by means of pull rolls, which also improves the toughness of the material.

The moving tube is slitted longitudinally by a stationary knife at a point beyond the stretching mandrel. The slitted tube is then laid open as a continuous flat sheet and is rolled upon itself as roll stock.

To make an egg carton, the flat sheet material fed from the roll is led to a thermoforming machine in which it is

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[5] Although the carton is "integrally" molded, some "after pressing" is regularly used.

[6] The Court has closely followed the description in Defendant's Main Brief After Trial, pp. 25-28.

gradually reheated to render it thermoplastic, but without bursting the contained the contained bubbles. When suitably thermoplastic, a length is advanced to a position between chilled or cooled dies having non-porous mating faces of the desired egg carton shape. These dies, brought toward one another, deform the sheet. The cooled dies cool the thermoplastic sheet material so that it becomes immobilized.

The next step is the punching of holes or apertures in the cover for the reception of lugs formed by the dies.

Finally, the excess marginal portions of the sheet are trimmed by cutting dies which separate the formed cartons from the sheet margins. The trimmings and aperture punchings are reground and recharged to the extruder.

The Court's comments by way of partial summary were as follows:

> "It seemed to me that the physical and mechanical procedures at Palmer [7] and Lawrenceville were quite different, although each seems to involve a molding process. Palmer is a molding by agglomeration of disassociated particles, which are then dried and sometimes pressed, and in that sense, perhaps, thermo-refined. (Tr. p. 600).
>
> "The molding at Lawrenceville is accomplished by softening sheets, then forming cartons by dies 'deforming' the flat sheets . . . (Trfl p. 600).
>
> "I also noticed as we were coming up that there was some differentiation. In Palmer, a defoamer is inserted, while at Lawrenceville, a foam generator is considered to be indispensible." (Tr. p. 603)."

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[7] The plants visited were Plaintiff's in Palmer, Massachusetts, and Defendant's in Lawrenceville, Georgia. Each has plants at other locations.

VALIDITY

Defendant urges that the decision in *Walterhoefer* is not controlling, on a number of grounds:

1. Koppelman Patent No. 2,093,280, issued September 14, 1937, on application filed December 6, 1934, for "Self Locking Carton and Packing."

a. In *Walterhoefer,* Koppelman was urged as a defense under 35 U.S.C. Section 108—obviousness. In this case the Defendant oscillates in its briefs from a claim of anticipation under 35 U.S.C. Section 102, to anticipation under Section 103 if coupled with another patent, or other patents. However, in the final arguments Defendant admitted,[8] albeit reluctantly, that Koppelman was not an anticipation.

Koppelman was fully and carefully considered in *Waltelhoefer* (289 F.Supp. 559-561) and by the Patent Office Board of Appeals (289 F.Supp. 561), and the argument repeated here, was rejected that the results of Reifers could be reached simply by inverting Koppelman.[9] As was pointed out in *Walterhoefer,* Koppelman stressed and relied upon the weight and pressure of the eggs in effecting and maintaining the closure of the carton as described in the patent. The court stated (289 F.Supp. 561):

> "Certainly gravity could not be inverted with the inversion of the carton, and 'weight and pressure of the articles in the carton' could *not* be employed in part to hold the closure."

The Court is unaware of any relevant change in the operation of the laws of gravity since the *Walterhoefer* decision.

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[8] Tr. p. 2373.

[9] *See* Block v. Nathan, 9 F.2d 311 (2 Cir. 1925), cited in Cowles Co. v. Frost-White, 174 F.2d 868 (2 Cir. 1949).

b. This Court also stated in *Walterhoefer* (289 F.Supp. 560) that:

> "... there was no evidence that Koppelman '280 had ever been constructed, or that any one had ever seen a physical embodiment of such a structure, ... although there was uncontradicted affirmative evidence that it could not be commercially made, and if made would be inoperative ..."

It is not believed that Defendant challenges the accuracy of that statement on the basis of the record before the Court at the time it was made. Defendant does claim that subsequently discovered evidence shows "that a molded pulp carton having cooperative lugs and apertures was made commercially according to the disclosure and teachings of Koppelman ..."[10] This is based upon the testimony of Ralph A. Farnham, and the exhibits produced by him.

Because Defendant's position as to newly discovered evidence is based solely upon the testimony of Farnham, and because the Court was initially misled by Farnham's testimony,[11] his testimony in court, and subsequently by way of deposition[12] will be summarized in more than usual detail.

In his direct examination in court, Farnham testified that until his retirement some twenty-five years ago[13] he had been in charge of manufacturing at the Herkimer, New York plant of International Paper Company, under Read,

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[10] Defendant's Main Brief After Trial, pp. 42-43.

[11] It is unnecessary to determine whether or not the Court was originally too trusting, or whether Farnham deliberately pitched a plausible argument upon half or full nondisclosures.

[12] The case being reopened for this purpose.

[13] He was seventy-five years old at the time of the trial.

General Manager. Among other things, it produced molded pulp egg "flats".[14] He produced a carton made at Herkimer about five weeks before trial. (Defendant's Txhibit 94). He testified that he became familiar with the Koppelman "patent"[15] in 1934-35, "and then we put it on the machine, the latter part of 1937 . . ." (Tr. p. 2025). "This happens to be an egg carrier of personally my own design . . . " (2026). It related to figures 1, 2 and 5 of the Koppelman patent (2025).[16]

To manufacture Defendant's Exhibit 96, Farnham "went to the paper mill in Herkimer and dug up one of the old dry[17] heads that I used years ago on the machine." (2028).

In explaining how the dry head was used, Farnham testified:

> "Q. And how did you use it?
>
> "A. We put fine wire, we stretched fine wire over the dry head and in order to do that we had to anneal it, of course, three times, and after we put it on we sewed it on with fine threads, then we fastened it on to a wooden suction suction box, the head, itself, with a suction hose on the back. We turned it over and

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[14] A word used by Farnham as descriptive of any egg container, whether in the form of a carton, or tray for insertion into a sleeve. The more accurate trade terms are discussed at page 551 in 289 F.Supp.

[15] Issued September 14, 1937, on application filed December 6, 1934.

[16] Perhaps this should have aroused the Court's suspicion. While Figure 2 purports to be a cross section of Figure 1, Figure 5 is a plan of the embodiment of Figure 4 which in turn is a modification of Figure 1. (Koppelman Patent '280, Col. 2, ls. 11-25).

[17] In production, cartons are formed on the "wet" or male head, and transferred to the dry, or female head. The use of the dry head led to wire marks being on the outside of the carton instead of the inside; and to some recalcitrance on the part of Farnham to admit to any possibility of misnomer or mistake.

stuck it down into a vat of moving pulp which we kept agitated with a paddle, pulled it out, took the clamps off, and took the casting with the egg carrier on it and put it up in front of an electric fan and dried it." (2031).

With respect to the holes in the cover, Farnham replied that they were blanked off in 3/8th inch squares. In response to a question by the Court, Farnham testified that the blanks satisfactorily made the holes and that it was not necessary to do anything in the way of blowing or wiping, or anything else to perfect the holes. (2062).

Farnham's testimony was unclear as to the length of time over which these cartons were manufactured, on occasion indicating that it was during the years 1937-8-9-40 for periods of not less than three months at a time; for three years; they ran "a small number of them" (2059); he could not say even approximately how many three month periods were run (2024), but production was in the millions (2058).[18] He knew they were "going out" because customers could not get enough printing on them. (2043).

The only use testified to by Farnham was for handpacking the eggs from his own chicken farm. They were put into the "flap side of the carton", the flap going up under the cover (2036). He had no knowledge as to whether or not Defendant's Exhibit 94 was ever automatically filled or closed by machinery. (2062).

When demonstrated in court, the top of the egg section of Defendant's Exhibit 94 appeared to be one-half inch below the top of the cover section, so that no locking occurred. Farnham's answer was that "When the eggs are

[18] On Farnham's estimated production (2040) a three month production would have been about 9,000,000. Egg carton production is in the billions. Had there been any substantial production of inverted Koppelman cartons, it seems not unlikely that at least *one* would survive.

in there, it pushes out, so they lock."[19] Moreover, being made on a dry head, it was too small "for a regular sized egg." (2063).

Plaintiff made a timely motion to strike Farnham's testimony as not the best evidence for failure to produce the "forms" from which the cartons were made. The Court, under the impression that the only change made to the dry head was stretching wire over it,[20] and that with this addition it functioned satisfactorily[21] unfortunately[22] overruled the motion without conditioning it upon the dry head actually used being produced in court.

Testimony was concluded the day after Farnham testified, and the case was closed, except for the filing of transcripts and briefs, and final argument. About six weeks thereafter, Plaintiff took Farnham's deposition and filed a motion to reopen on the ground of newly discovered evidence. After a hearing, the motion was granted, and Farnham's deposition was filed.[23]

The deposition contained some startling information.

Although the aluminum heads had been difficult to find, and were not his, Farnham melted down the one he allegedly used "shortly after I got back from Baltimore . . ." (Dep. 54, 20)[24] and made plaques from it.

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[19] This would mean that if the first row of eggs were to be removed, the carton would not lock. One of the great merits of Reifers '094 is that it will lock if full, empty, or with any number of eggs from one to twelve, in any cell or cells.

[20] See Farnham's testimony (2031) quoted above.

[21] Tr. 2043-44, 2062.

[22] As will be seen, the dry head was destroyed by Farnham within a few days after his testimony.

[23] Exhibit A to Docket Entry (104).

[24] "Dep." refers to Exhibit A to Docket Entry (104).

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In the course of the deposition, in Farnham's presence, counsel for Plaintiff stated that in an interview before the deposition Farnham had told him that the dry heads "were taken down to Baltimore." (Dep. 41). There was no denial as to the accuracy of counsel's statement. Counsel for Defendant denied that they had ever seen the dry heads.

This opinion has already set forth the exact language of Farnham when asked how he used the dry head. The only modification to which he referred was stretching annealing, and sewing fine wire over the dry head. (2031). Much more elaborate procedure, with one extremely important addition, was detailed in the deposition. Four metal strips were used to hold the fine wire onto the casting (Dep. 13); two crude wooden forming tools were used to shape the wire (Dep. 14-17); *the dry head had no flap with buttons on it;*[25] this part was added (Dep. 43) and the ends were carved (Dep. 52).

The head Farnham used "was used before we designed the one with the flap." (Dep. 45).

In contrast to his testimony in court that the holes were satisfactorily made in the cover, and that it was not "necessary to do anything in the way of blowing or wiping, or anything else to perfect the holes" (2062) in his deposition he said "and the square holes, here, we trimmed them with a knife. When the feather edge went in the pulp went underneath those . . . with a knife when the stock would go underneath the thing a little bit." (Dep. 50).

This Court entertains grave doubts as to the reliability of any of the Farnham testimony, or that the supposed Koppelman carton (Defendant's Exhibit 94) was ever made. The dry head used had regularly been used for a non-lockable carton.

Even if Defendant's Exhibit 94 were ever made, there is no evidence that it was ever made, or used, commercially.

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[25] Indispensable, if the carton were to be fastened, automatically.

Its construction made it unsuitable for automatic loading or closing—indispensable requirements for a satisfactory egg carton. Moreover, even if used, it could serve its purpose of remaining locked until manually opened, only so long as at least the front row was completely filled with eggs.

Koppelman '280 revisited does not incline, much less persuade, the Court to change its conclusion and ruling in *Walterhoefer*.[26]

2. Cox Patent 2,517,465 ('465).

Cox Patent '465 for Molded Polp Carton issued August 1, 1950, on application filed September 20, 1943. It was extensively considered in *Walterhoefer*.[27]

Cox '465 discloses (a) a locking flange 22 hingedly connected to the upper edge of the front wall of the tray section; (b) a locking flange carrying locking tabs 24 adapted lockingly to engage slots or openings 21 from the outside in, the engagement occurring from above the top of the tray section; and (c) the location of the tabs when in locking engagement "preferably" being such that the "locking tabs will be partitioned between adjacent eggs", although it is by no means clear that this would be the case in the structures shown in Figures 5 and 7.

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[26] This makes it unnecessary to consider cases cited by Defendant (Main Brief After Trial 53) for the proposition that the burden of proof of abandonment is on Plaintiff. Two of these, Aerovox Corp. v. Polymet Mfg. Co., 67 F.2d 860, 861 (2 Cir. 1933) and National Biscuit Co. v. Crown Baking Co., 105 F.2d 422, 425 (1 Cir. 1939) hold that once public use is proved, the burden is on the plaintiff to prove that the use was secret or experimental. The third, Electrol, Inc. v. Merrell & Co., 39 F.2d 873, 878 (8 Cir. 1930) held that where there had been "successful operation" for several years, it cannot be held to be an abandoned experiment simply because its opertion is not continued indefinitely.

[27] There, as here, on two grounds: (a) obviousness of Reifers '094; and (b) fraud on the Patent Office.

Defendant asserts that it would be "an affront to the intelligence" of any person "to think that he would not be smart enough to see that the tongues and apertures were intended and positioned to be interengaged"; and that this could be done with the flange on the outside or on the inside of the cover.[28]

Aside from the structural changes that would be required, and the express teachings of the patent, it would not be satisfactory to try to fasten Cox '465 from the inside out.

(a) Cox, the inventor, realized the impracticality of the carton even making the closure from the outside in. On paper the idea seemed good, but when he saw the actual construction he recognized that "it was completely impossible." He doubted that a machine could be developed to insert the tabs. The tabs when manually inserted tore off: and the front flap would bow outwardly even if the tabs were inserted. In fact, even at the time of invention Cox was so uncertain as to the practicability of the lock that he disclosed alternative means of locking the flap to the front wall by thermoplastic adhesive.

Cox's summation was that "This carton was completely inadequate to meet any of our commercial requirements, and never went into commercial use."[29]

(b) If it were doubtful that automatic closing could be effected where the tabs were inserted from the outside, it would be even, and much, more difficult to devise a machine that could automatically effect a closure when the tabs were to be inserted from the inside out. It is much simpler to bend the tabs inwardly from the outside than to bend them outwardly from the inside. The flap would have to be pushed very far in as the top came over. The flap would

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[28] Defendant's Main Brief After Trial, p. 60.

[29] 289 F.Supp. at 567.

have to be built with a reverse curve so that after insertion the tabs would curl back onto the face of the lid; otherwise the tabs would be projecting out, and would be torn off in ordinary use.[30]

Cox '465 does not make Reifers '094 obvious. It emphasizes the merit of the simple, but complete effective, Reifers carton.

3. Pollard, et al.[31]

Defendant cites six patents and one article in support of the contention that the button and hole lock was old—but none dealt with an article at all resembling, or comparable to, an egg carton, whether of molded pulp or plastic. They are:

(a) Pollard, 320,814 issued June 23, 1885, on application filed March 27, 1885, for "Car Ticket or Stamp Box."

The article was to be "stamped out or otherwise made at slight cost." (Col. 2, ls. 43-44).

A stud on an outward tensioned section, when the lid is closed, enters "a recess or opening . . . formed into or through the cover . . ." (Col. 2, ls. 43-44).

No compartments or tying partitions are shown.

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[30] Court's comments, Tr. 2286-90; 2298.

The opinion of the Court has not changed from that expressed in Walterhoefer, 289 F.Supp. 562, fn. 29.

> "Of course, anything can be done; but what you would have to do is make an arc out of this fastening piece on the tray and then relax it and push it in at the same time and then straighten it out and I suppose that could be done by machinery, but it is in no way comparable to simply pushing in and closing the lid."

To which might be added the question—if the carton were opened by a customer, how would she (or he) be able to relock it?

[31] The question of whether or not Reifers '094 covers plastic egg cartons is treated later.

(b) Hooper, Br. 406,159 issued February 22, 1934, on application filed May 11, 1933, for "Improvements in Boxes or Cases for Jewelry or Other Light Articles."

The box is of molded synthetic resin. The bottom has a relatively thin tongue "in which is fixed a pin having a projective head . . ." (Col. 2, ls. 78-79) which on closing enters a recess in the top.

(c) Vogel 2,483,304 issued September 27, 1949, on application filed December 11, 1945, for "Container" for "a cigarette package or the like" (Col. 1, l. 2) to be made of plastic or other suitable material. A nub or projection in the base engaged a small dimple or recess in the forward wall of the cover part (Col. 4, ls. 73-75). This can be reversed, putting the projection on the cover, and the recess in the flange. (Col. 5, ls. 2-3).

(d) Vogel 2,509,462 issued May 30, 1950, on application filed August 15, 1946, for "Spring Hinge".

". . . a retaining projection 27 formed on the forward wall of flange 20 . . ." engages "within a retaining recess 28 in the forward wall of the cover part . . ." (Col. 3, ls. 72-75).

The claims do not refer to the locking device.

(e) DeWitt 2,215,856 issued August 2, 1938, on application filed June 27, 1936, for "Box".

Although not limited thereto, the patent was at least primarily directed to a tackle box of transparent or translucent material (Col. 1, l. 15) such as celluloid (Col. 1, l. 39).

The specification is far from clear as to the closing mechanisms. While it appears that 13 represents recesses in the cover and projections in the tray, Col. 1, lines 53-55 refer to 13 as "*Knobs* in the front wall of the base and cover." (Emphasis supplied).

While compartments are shown, there is no hinged top.

(f) Hunziker 1,354,042 issued September 28, 1920, on application filed March 8, 1920, for "Cigarette Case."

Hunziker is fully described and analyzed in *Walterhoefer,* 289 F.Supp. at 558. While the Court pointed out on page 559 of 289 F.Supp. the improbability that Hunziker would be discovered (or chargeable to) one in the molded pulp egg carton field, its conclusion was then even if Hunziker '042 had been found, it would not be pertinent. The Court is of the opinion that the same reasoning applies to polystyrene egg cartons, and that the following language (289 F.Supp. at 559) is sound today, with respect to egg cartons, whether of molded pulp or polystyrene:

> ". . . Hunziker had no flap, or hinged flange, on the 'tray' portion, a feature indispensable in Cox '233 and Reifers '094 for purposes of automated loading and closing; and for safety loading. Opening in Hunziker was accomplished by pushing in the entire bottom or tray section—not pushing in the lug or a flange; and loading was to be from the side, not from above. The Hunziker locking system would be completely (commercially) impracticable in a molded pulp egg carton without serious modifications—e. g., a hinged flange on the 'tray' section, which would not only be suggested by Hunziker, but which would make Hunziker unworkable.
>
> "The court has been referred to no authority for the proposition that, and has a presently insuperable difficulty in understanding how, a device which requires a modification making it unworkable suggests such a modification in any field, let alone an unrelated one."

(g) Modern Plastics, April 1946, page 177.

"Latching Methods"

"Whenever a hinge without a spring is used, some method must be devised for keeping the cover in a

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closed position. Figures 11 and 12 show two methods of accomplishing this. In Fig. 11, an undercut bump is molded on the inside of the cover and a corresponding slot is either molded or ground on the outside of the bottom. When rigid materials are used, assembly must be accomplished with great accuracy.

"Another method, shown in Fig. 12, allows for greater variation in the closed location of the top and bottom. In this case, a clip of flexible spring brass is stamped out so that the upper portion has a rounded undercut and the body has a sharp protrusion. A vertical slot is molded in the bottom of the box. The spring clip is then assembled in this slot, and held rigidly in position by the sharp protrusion. An undercut bump is molded in the proper location in the cover so that it will engage with the spring clip. Slight variations in the relative locations of the top and bottom of the box can be compensated for by vending the spring clip either forward or backward."

Note that in both instances the insertion is from the outside in, just as in the pre-Reifers '094 art. Also, in the Fig. 12 illustration, a "clip of flexible spring brass" is used.

If, as Defendant urges, the bottom and hole lock was so obvious and well-known, the Examiners in the Patent Office should not have allowed any patent based on this lock to issue after Pollard. It is clear that the button and hole lock has many possible applications. Those above cited do not suggest its acceptable application to egg cartons whether of molded pulp or polystyrene. In none of the instances was the article suitable for an egg carton. In many, there were no compartments or tying partitions. None was intended for automatable filling, or for nesting—both indispensable for a commercially acceptable egg carton.

None of these singly, in combination, or together did what Reifers '094 did—provide an integrally connected

egg carton, fully capable of automatable filling; manual opening and reclosing; and effective with or without contents; and nestable.

The "state of the art" at the time of the Reifers '094 invention was considered in *Walterhoefer,* 289 F.Supp. 563-568. This Court concluded then that Reifers '094 was a valid patent for a molded pulp egg carton. A review of Cuno Engineering Corporation v. Automatic Devices Corporation, 314 U.S. 84, 62 S.Ct. 37 86 L.Ed. 58 (1941); Great Atlantic & Pacific Tea Co. v. Supermarket Equipment Corporation, 340 U.S. 147, 71 S.Ct. 127, 95 L.Ed. 162 (1950); Graham v. John Deere Co., 383 U.S. 1, 68 S.Ct. 684, 15 L.Ed.2d 545 (1966); Anderson's Black Rock, Inc. v. Pavement Salvage Co., Inc., 396 U.S. 57, 90 S.Ct. 305, 24 L.Ed.2d 258 (1969); and National Steel Corporation v. Baltimore & Ohio Railroad, 313 F.Supp. 934 (D.Md. 1970) does not lead to any other or different conclusion today.

Three additional facts support the conclusion of validity. (1) Commercial success is admitted.

> "Unquestionably, the Diamond carton that evolved was a commercial success. Diamond profited handsomely—it sold billions of cartons." [32]

The limited, but sometimes important, effect of commercial success was considered in *Walterhoefer* with the standard citations (289 F.Supp. 569-570).

(2) Dolco's advertising contained pictorial representations of an egg carton, emphasizing a lock either identical with, or similar to the appearance of, the Reifers button lock. In the lower lefthand corner of the fourth page of Dolco's twelve page brochure (Plaintiff's Exhibit 45) entitled "How to order your own Kool-Pak Cushion Foam Egg Cartons" the following caption appears under a pic-

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[32] Defendant's Reply Brief re Validity, 43.

ture showing a button of the Dolco carton protruding through the opening formed in the front wall of the cover:

> "Revolutionary Easy Lock works perfectly on existing closure equipment to fasten lids firmly in place."

In Dolco's advertisements (Plaintiff's Exhibit 46, Plaintiff's Exhibit 47) the claim is made for the lock that:

> "*Patented* 'Easy Lock' proven fool proof, works perfectly on existing equipment." (Emphasis added).

Continental Packaging Corporation on November 18, 1968, wrote [33] to Dolco (Plaintiff's Exhibit 59A), referring to Dolco's "Patented Easy Lock" feature and inquired as to whether or not Dolco was referring to its own patent; to a license under Reifers '094; or to a "patent applied for" status. On December 27, 1968, Defendant's counsel replied, quite evasively, (Plaintiff's Exhibit 59D):

> "Upon inquiry, I find that the word 'Patented' appeared without intention of threat or warning to the trade but only with intention to illustrate various attributes of the Dolco cartons. To avoid possibilities of confusion or misunderstanding of intent, the working which prompted your inquiry is no longer being used in Dolco advertising."

This Court and this Circuit have frequently recognized the significance of the flattery of imitation.

In Otto v. Koppers Co., Inc., 246 F.2d 789, 800 (4 Cir. 1957), Judge Haynsworth stated:

> ". . . The oft quoted statement of Judge Hough in Kurz v. Belle Hat Lining Co., 2 Cir., 280 E. 277, 281 is appropriate here:

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[33] Defendant asserts that the letter was "put up" by the Plaintiff. Plaintiff denies this. No evidence was offered by either side on this point; which the Court in any event considers to be immaterial.

> 'The imitation of a thing patented by a defendant, who denies invention, has often been regarded, perhaps especially in this circuit, as conclusive evidence of what the defendant thinks of the patent and persuasive of what the rest of the world ought to think,'
>
> a principle well recognized in this Circuit. Ackermans v. General Motors Corp., 4 Cir., 202 F.2d 642; Black & Decker Mfg. Co. v. Baltimore Truck Tire Service Corp., 4 Cir., 40 F.2d 910."

See also McKee et al. v. Graton & Knight Co., 87 F.2d 262 (4 Cir. 1937); Rohm & Haas Co. v. Roberts Chemicals, Inc., 245 F.2d 693 (4 Cir. 1957).

As this Court stated in O. M. I. Corporation of America et al. v. Kelsh Instrument Company, Inc., 173 F.Supp. 445, 457, D.C.Md.; 279 F.2d 579 (4 Cir. 1960):

> ". . . This Circuit has often emphasized the great weight, on the question of validity, that should be accorded the flattery of imitation; that the presumption of validity is further buttressed when the one attacking validity 'gives the tribute of its praise to the prior art' but gives to the patent 'the tribute of its imitation.'"

See also Mobil Oil Corporation v. W. R. Grace & Co., 367 F.Supp. 207 (D.Conn. 1973):

> ". . . The fact that the defendant copied the inventions of the patents in suit rather than the prior art is further evidence of invention."

(3) Plaintiff has licensed the manufacture, use and sale of egg cartons under the Reifers '094 patent to the following substantial manufacturers of egg cartons:

> Molded Container Corporation, February 27, 1964, Plaintiff's Exhibit 161;

Keyes Film Company, January 1, 1966, Plaintiff's Exhibit 166;

Packaging Corporation of America, January 1, 1969, Plaintiff's Exhibit 167; and

Container Corporation of America, April 1, 1969, Plaintiff's Exhibit 168.

As will be further mentioned, the Packaging Corporation of America license covers "molded egg cartons" and "the substitution of materials such as molded plastic, including but not limited to molded foam plastic, for molded pulp . . ." (Paragraph 1(a)).

The Container Corporation of America license provides that "Egg cartons licensed hereunder shall include those made of molded foam plastic and molded pulp." (Paragraph 1(a)).

Container Corporation of America is actually engaged in the manufacture of molded foam plastic egg cartons under its license agreement.

The acceptance by the trade of licenses in this volume "is not without significance." American Precast Corp. v. Maurice Concrete Products Co., 360 F.Supp. 859, 863 (D.Mass.1973); Columbia Broadcasting System v. Sylvania Electric Products Co., 415 F.2d 719, 728, (1 Cir. 1969), cert. den. 396 U.S. 1061, 90 S. Ct. 755, 24 L.Ed. 755 (1970).

Having determined that *Walterhoefer* was correctly decided and that Reifers '094 was and is a valid patent for a novel molded pulp egg carton, nestable, capable of fully automatable filling and closing, and of manual opening and reclosing, whether full, partially filled, or empty, there still remain the questions as to whether or not (1) Reifers '094 is broad enough to cover polystyrene egg cartons; if so (2) is the accused carton an infringement; and is so (3)

is plaintiff for any reason barred from recovering for such infringement?

1. *Is Claim 1 Of Reifers '094 Broad Enough To Cover The Accused Device?*

It is importantly to be noted that the real question is not whether polystyrene is the equivalent of molded pulp, but whether Claim 1 of Reifers '094 is broad enough to cover the accused device—a polystyrene thermoformed egg carton. Plaintiff does not contend that all thermoformed polystyrene egg cartons infringe (see, for example, the Haveg carton, Plaintiff's, p. 31; Plaintiff's Exhibit 150).

Defendant claims that '094 does not cover the accused device on such a number of grounds that it is somewhat difficult not summarily to say "methinks thou dost protest too much." These include (a) File Wrapper Estoppel; (b) Preamble limitation; (c) Dedication; (d) Failure to Apply for Reissue; (e) Statement of Reifers' Attorney in prosecution.

(a) File Wrapper Estoppel.

Defendant vigorously, and repeatedly, argues that file wrapper estoppel applies to any attempt to assert that the claims of '094 cover polystyrene egg cartons. However, a review of the file wrappers shows that this is not one of the classic cases in which an application is amended and narrowed to get the Examiner's approval, and then after the issuance of the patent, it is sought to apply the broader, but withdrawn, scope. First, the Examiner never did accept the claim (Claim 1) in suit. Secondly, the Board of Appeals did not allow the claim because of, or based upon, any narrowing of the claim by amendment. Third, polystyrene is no where mentioned in the entire file.

Since Defendant relies, although without justification, upon file wrapper estoppel, an unusually detailed review of the file history is justified, if not required.

(1) The original application included fourteen claims directed to a molded pulp carton, and four claims directed to a lock construction per se. All were rejected as unpatentable over Koppelman 2,093,280. Minor amendments were filed to the pending claims, and four new claims were added, directed to a "onepiece molded pulp carton." Manufacturing advantages were claimed, and it was stated:

> ". . . To provide an improved carton construction which will lock itself closed is but a slight contribution to the art, indeed, if that carton cannot be successfully made on any existing type of pulp molding equipment." [34]

A supplemental amendment was filed, cancelling all claims then on file, adding six new claims, all directed to a molded pulp carton; and additions were made to the specification. Before any office action was taken, a second application was filed and the first application was abandoned. This second application included a specification different from the original one, and twelve claims directed to a "molded pulp egg carton." All claims were rejected on Cox 2,529,140, Koppelman 2,093,280, and Bergstein 2,474,-391. An amendment was filed, cancelling ten of the original twelve claims, and added five new ones. Two of these were directed to a "molded pulp carton" but three had no limitation [35] as to material. All claims were rejected on Koppelman and Cox. The Examiner did indicate, however, that Claim 17, one of the claims with no limitation as to material, would probably be allowable if it were amended to specify certain details as to frustro-conical surfaces of certain flanges. An amendment (Claim 18) was filed, but

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[34] Reference will again be made to the quoted language.

[35] "Limitation" is not used as a term of art, but here, and in the balance of the history of the prosecution in the Patent Office, means only that there was no direct reference to any particular material.

the suggestion of the Examiner was not specifically adopted.

(2) By amendment, one of the non-molded pulp claims was cancelled, and three new claims were filed not limited to molded pulp.

All claims were rejected as unpatentable over Koppelman in view of Cox.[36] The second application was abandoned in favor of a third. Its specification was substantially similar to that of the second. It contained eleven claims, of which the first six were not limited to molded pulp.

All claims were rejected on Shellman Australian Patent No. 164,896 and Koppelman 2,093,280 in view of Schilling 2,600,130. Various amendments were made, in the course of which Plaintiff sought to distinguish Koppelman on the ground that it required subsequent cutting or punching. On further rejection of all claims they were cancelled in favor of four new ones. These again were rejected on Koppelman, Cox and Schilling; and two new ones were filed, claiming "a nestable molded pulp egg carton made of relatively flexible molded pulp." These were disallowed, and an appeal was taken. In its appeal brief, Plaintiff stated that the "invention relates to molded pulp egg cartons capable of being mass produced by the suction pulp molding process." It was agreed that Koppelman and Schilling could not be molded. The Board of Appeals referred to the

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[36] Defendant says (Main Brief After Trial, p. 103) that: "*The Examiner thus refused to allow any claim that did not contain a limitation to 'molded pulp'.*" (Emphasis in original).

This is true, but at the best is quite disingenuous. The Examiner did refuse to allow any claim that did not contain the words "molded pulp". But he also refused to allow any claims that *did* contain the words "molded pulp". He refused to allow *any* claims.

claimed subject matter as relating "to a molded pulp egg carton."

(3) This is not a case in which, in order to get a claim allowed, an applicant amends his claim to meet the Examiner's objection, after which the claim is allowed. Hence cases such as Exhibit Supply Co. v. Ace Corp., 315 U.S. 126, 136, 62 S.Ct. 513, 86 L.Ed. 736 (1942); I. T. S. Co. v. Essex Co., 272 U.S. 429, 443, 47 S.Ct. 136, 71 L.Ed. 335; Baker-Cammock Hosiery Mills v. Davis Co., 181 F.2d 550, 563 (4 Cir. 1950); Carter Products, Inc. v. Colgate & Palmolive Company, 165 F.Supp. 503, 520 (D.Md.1958), aff'd. 269 F.2d 299 (4 Cir. 1959); Doughnut Mach. Corporation v. Joe-Lowe Corporation, 67 F.2d 135 (4 Cir. 1933); International Latex Corp. v. Warner Bros. Co., 276 F.2d 557 (2 Cir. 1960); Dow Corning Corporation v. Chertkof, 243 F.Supp. 947 (D.Md.1965); Long Manufacturing Co. v. Holliday, 246 F.2d 95 (4 Cir. 1957); and Parke, Davis & Co. v. American Cyanimid Co., 207 F.2d 571 (6 Cir. 1953), are not in point.

In the instant case the Examiner consistently refused to allow any claim, whether or not incorporating the words "molded pulp" on the ground of lack of invention over the prior art, all of which involved molded pulp; and in only one instance (where no specification of material appeared) did he indicate how his objection could probably be met by amendment.

The prosecution of the patent does not involve this usual aspect of file wrapper estoppel.

(b) Preamble Limitation.

Defendant contends that the first twelve (really thirteen) words of Claim 1:

> "In an integral and nestable egg carton made of relatively flexible molded pulp"

and the language, appearing at about the middle of Claim 1 "said molded pulp carton being integrally formed" con-

stitute a "preamble limitation," precluding polystyrene being covered by Claim 1. In part this would appear to be another facet of file wrapper estoppel. It is primarily discussed by Defendant, however, in connection with infringement.

Although all cases cited by Defendant and Plaintiff will be mentioned, probably the most thorough discussion of the principles involved is found in Kropa v. Robie, 187 F.2d 150, 38 CCPA 858 (1951) when the Court stated:

> "Is the phrase 'An abrasive article' a limitation upon what follows in the counts in issue? This court has often had before it the Jepson problem (243 O.G. 525—1917)—whether the preamble to claims in ex parte cases or to the counts in interference cases should be considered as limitations in the claims or counts. Of the thirty-seven cases [37] of this court we have reviewed with respect to this problem it appears that *the preamble has been denied the effect of a limitation where the claim or count was drawn to a structure and the portion of the claim following the preamble was a self-contained description of the structure not depending for completeness upon the introductory clause;* or where the claim or count was drawn to a *product* and the introductory clause merely recited a property inherent in the old composition defined by the *remaining part* of the claim. In those cases, the claim or count apart from the introductory clause completely defined the subject matter, and the preamble merely stated a purpose or intended use of that subject matter."

* * * * * * * * *

[37] The score card would show that in twenty-three ex parte cases and four interference cases the Preamble was held not to express a limitation, while in six ex parte cases and four interference cases Preamble language was held to be a limitation.

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> ". . . On the other hand, in those ex parte and interference cases where the preamble to the claim or count was expressly or by necessary implication given the effect of a limitation, the introductory phrase was deemed essential to point out the invention defined by the claim or count. In the latter class of cases, *the preamble was considered necessary to give life, meaning, and vitality to the claims or counts.*" (Emphasis supplied).

Even more succinctly, the Fourth Circuit stated in Marston v. J. C. Penney Co., 353 F.2d 976, 986 (4 Cir. 1965):

> "If the preamble merely states a purpose or intended use and the remainder of the claim completely defines the invention independent of the preamble, it is not a limitation on the claims. On the other hand, if the claim cannot be read independently of the preamble and the preamble must be read to give meaning to the claim or is essential to point out the invention, it constitutes a limitation upon the claim."

The general rule, and its exception, were recognized in Stradar v. Watson, 100 U.S.App.D.C. 289, 244 F.2d 737, 741 (1957), where each claim contained not only the same preamble, but the same concluding limiting language.

In Deutsch et al. v. Ball, 77 F.2d 930 (CCPA 1925) the court held that in interference proceedings the senior party was entitled to prevail over the junior party, whose claim was identical with that of the senior party except for the insertion in the claim of the use to which the junior party sought to apply his invention.

On the other hand, the court in Application of DeNapoli, 302 F.2d 768, 39 CCPA 1056 (1962) held that the limitation in the preamble by the words "In a phonographic transcribing machine" cooperated with the rest of the structure in such a way as to avoid the prior art which

corresponded to all of the structure, except for the preamble, but in a different environment.

It might be noted that neither Reifers' Data of Invention (Plaintiff's Exhibit 132) nor his more detailed write-up of his invention (Defendant's Exhibit 61) makes any reference to the material from which the patented article was to be made. On cross-examination Reifers testified that he was not told to make his carton of molded wood pulp; that the material was not discussed.[38]

This Court believes its summary[39] to be an adequate and accurate summary of Reifers' attitude with respect to material:

> "Whether he [Reifers] should have foreseen what was going to happen or whether he shouldn't, is something that is going to be argued and I am going to have to try to determine it significance wise. He has made a very forceful approach to 'I wasn't concerned about material. I was concerned about a concept of a lock on an egg carton . . .'—'It seemed to me that it didn't make any particular difference what the material was. I was working, everybody was working with either chipboards or molded fiber at that time and that, therefore, it seemed to me that to say how it should be done on egg cartons of this kind, was all I had to do."

The Court finds no basis for the exclusion of polystyrene from the scope of Claim 1 on the ground of Preamble Limitation.

(c) Dedication.

Defendant's argument here overlaps the defense of file wrapper estoppel. In addition, Defendant argues that there was dedication, evidenced by:

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[38] Transcript 1265.

[39] Transcript 1640.

(i) Claim 1, for a carton made of relatively flexible molded pulp. The file history has been adequately reviewed herein.

(ii) A letter (Defendant's Exhibit 52) of May 17, 1951, from Carl Flocks, then and now patent counsel, that:

> "What will become the Reifers patent claim 1 has the following mandatory features:
>
> "(a) A molded pulp carton having an integral cellular tray . . ."

Plaintiff adequately replies that this communication was directed to the applicability of forthcoming Claim 1 to a molded pulp egg carton made according to Lambert Patent No. 2,978,162 which had issued shortly before. Since the carton in fact constructed under what became Reifers '094 was also a molded pulp egg carton, it would have been irrelevant to go beyond the similar features of the two cartons.[40]

(iii) The statement by Plaintiff's counsel on November 16, 1958, in General Packaging Corporation (The Diamond Match Company, assignee) v. Atlas Tack Corp., In the United States District Court for the Northern District of New York, Civil Action No. 5126, that

> "The words 'molded carton' refer to a carton molded from a slurry of paper pulp."

This was in response to a demand for a "bill of particulars" as to why the accused carton was claimed to infringe the Sherman Tab-Lock Patent No. 2,587,909 (Plaintiff's Exhibit 71), in which the various clauses of Claim 1

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[40] Even if the quotation were an accurate appraisal of Mr. Flocks' then thoughts of the scope of Reifers '094, which it is not, it would not be binding on this Court any more than is Mr. Flocks' oft-repeated opinion that the accused structure is covered by, and an infringement of, Reifers '094.

of Sherman were related to the accused carton. That carton was also molded from a slurry of paper pulp. That the response was intended only to show that identical elements were found in both articles, is clear by the second sentence:

> "The words 'a molded carton' refer to a carton molded from a slurry of paper pulp. Defendant's cartons, Interrogatory Exhibits A and B, are such molded cartons . . ."

This response related to a patent other than Reifers '094; but both the Sherman and the accused devices were molded pulp. It was therefore necessary, on the infringement issues, to point out only the exact reading of Sherman on the accused device. It was not necessary to rely upon the doctrine of equivalents, and the failure to do so would not have been, even as to Reifers, a waiver or an estoppel.

(d) Failure To Apply For Reissue.

Defendant strenuously contends that the failure of Plaintiff to apply for reissue, apparently to claim for polystyrene cartons, is an abandonment of the right now to assert that Claim 1 of '094 covers (any) polystyrene egg carton.

Section 251 of United States Code Title 35, reads in pertinent part:

> "Whenever any patent is, through error without any deceptive intention, deemed wholly or partly inoperative or invalid, by reason of a defective specification or drawing, or by reason of the patentee claiming more or less than he had a right to claim in the patent, the Commissioner shall, on the surrender of such patent and the payment of the fee required by law, reissue the patent for the invention disclosed in the original patent, and in accordance with a new and amended application, for the unexpired part of the term of the

original patent. No new matter shall be introduced into the application for reissue."

* * * * * * * * *

"No reissued patent shall be granted enlarging the scope of the claims of the original patent unless applied for within two years from the grant of the original patent."

Defendant contends [41] that:

"... The evidence in this case clearly established that prior to the expiration of the time within which Reifers could have applied for reissue in June 1963, there were so many indications that plastic cartons were on the horizon that it is impossible to believe that Reifers and the Plaintiff didn't know of them."

Although efforts toward the development of polystyrene that might, among other things, be useful for the manufacture of egg cartons had been carried on before 1963, the evidence would seem to establish that while some effort toward commercial production occurred in 1965,[42] the first real commercial production of egg cartons from Dow polystyene foam was in 1968.[43]

Five years, or even two years, would seem to a rather far horizon to require Reifers to see and appreciate.

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[41] Defendant's Main Brief After Trial.

[42] Snow, Defendant's witness and inventor in Snow Patents No. 3,398,875 and No. 3,603,499; and Transcript p. 1918.

[43] Dow's Memorandum in support of Motion to Dismiss as to it the Complaint herein, filed October 29, 1969:

"... In fact, although the material [Dow's polystylene foam] has been on the market since as early as 1964, it was only in 1968 that anyone succeeded commercially in manufacturing egg cartons out of it."

[Bracketed matter inserted].

Morover, if Defendant should prove that in 1963 plastic was known as the equivalent of molded pulp, it would be covered by Claim 1 without amendment.

> ". . . Mere formal alterations in a combination in letters patent, however, are no defense to the charge of infringement, and the withdrawal of one ingredient from the same and the substitution of another which was well known at the date of the patent as a proper substitute for the one withdrawn, is a mere formal alteration of the combination if the ingredient substituted performs substantially the same function as the one withdrawn."

Seymour v. Osborne, 78 U.S. (11 Wall) 516, 555-556, 20 L.Ed. 33 (1871); Laser Alignment, Inc. v. Woodruff & Sons, Inc., 491 F.2d 866 (7 Cir. 1974).

If polystyrene in 1963 was well known as the equivalent of molded pulp, there was no need to claim it. If it was not, then it could not properly be claimed by reissue, but would require a separate application and a different patent.

As the Court, perhaps somewhat inelegantly, stated in the course of the trial, you do not negative something that is going to happen in the future, or put in the patent that you claim "anything else the Lord may give us the insight to develop which can be used." [44]

This case was filed May 26, 1969. Defendant certainly knew that an important question would be the availability of polystyrene for egg cartons in the period 1952-1963, and whether during that period any egg cartons, with or without the Reifers lock, had been made. The Plaintiff knew this also, and directed Interrogatory 93 to Defendant, as follows:

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[44] Transcript 224.

"93. Was foam polystyrene sheeting, suitable for the forming of thermoformed egg cartons, commercially available in 1961?"

The original answer, filed about January 5, 1971, reads as follows:

"The quality of foam polystyrene sheeting, its availability, or its suitability for the forming of thermoformed egg cartons as of February 1952 or 1961 is unknown to the Defendant. *Defendant believes* that foam polystyrene sheeting was *unknown* as of February 1952, *or, if known, was no more than a laboratory curiosity.* The same answer applies to 1961." (Emphasis added).

The trial began on March 1, 1971, and after hearing opening statements the Court and parties visited Palmer (Plaintiff's plant) and Lawrenceville (Dolco's plant). Upon return and before the taking of any testimony the Court indicated [45] the probable significance of the availability of foam polystyrene, and particularly if "practical cartons were being made at that time."

So alerted and alarmed, Defendant filed an amended answer on January 27, 1971, stating:

"To avoid any possibility that Plaintiff may be misled by Defendant's previously filed response to Plaintiff's interrogatory No. 93, Defendant hereby informs, and notifies Plaintiff of facts which have come to the attention of Defendant's counsel subsequent to the time Defendant's original answer to interrogatory No. 93 was filed and upon which Defendant will rely at trial."

The amended answer lists some thirty-five publications or patents and two court decisions. Defendant contends

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[45] Transcript 223, 224, 227.

that these describe usage of foam polystyrene sheet materials produced by the extrusion process in the manufacture of various types of products including containers "similar to egg cartons, but not specifically including egg cartons." [46]

Defendant refers to abortive efforts by Mead Corporation beginning in 1961 to make egg cartons from flexible styrene foam; and the work of Container Corporation of America on foam sheet material from 1962, and production for sale in 1965. However, as previously noted, on April 1, 1969, after the Walterhoefer decision, Container Corporation of America took a license for egg cartons "made of molded foam plastic and molded pulp" (Plaintiff's Exhibit 168); and is actually manufacturing molded foam plastic egg cartons under that license.

From the foregoing, the Court holds that Plaintiff is not barred by its failure to apply for a reissue patent, from claiming that Claim 1 of Reifers '094 reads on the accused carton.[47]

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[46] Pretrial Order, par. 49.

[47] Defendant contends that Plaintiff was afraid to apply for a reissue patent because ". . . he was afraid that if he advanced a new claim broad enough to cover foamed polystyrene the Patent Office would turn him down as it had done some four times previously . . . [H]e would have been *conclusively* prevented from contending that it was broad enough to cover foamed polystyrene."

(a) The Patent Office Examiner never rejected a claim specifying polystyrene. He did reject claims broader than molded pulp, but he also rejected claims containing those words; he rejected all claims.

(b) Rejection is an application for reissue and abandonment of appeal do not give rise to "file wrapper estoppel, collateral estoppel or *res judicata*, so as to preclude a plaintiff . . . from asserting the doctrine of equivalents." 4 Deller's Walker on Patents, Sec. 308; M.O.S. Corp. v. John I. Haas Co., 332 F.2d 910, 915 (9 Cir. 1964).

(e) Statement of Reifers' Attorney In Prosecution.

In the course of the prosecution of the Reifers patent, his attorney said, in part:[48]

> ". . . To provide an improved carton construction which will lock itself closed is but a slight contribution to the art, indeed, if that carton cannot be made on any existing type of pulp molding equipment."

First, this argument was made in relation to Claim 2 of Reifers '094, relating to locating the locking lugs on the top margin of the flap and the locking apertures at the junction of the top cover panel with the cover front wall. That claim is not involved in this litigation.

Secondly, paperboard and molded pulp were the egg cartons then in use. Reifers was working with pulp molding equipment, and if the patented carton could not be molded, but only, say, made by hand, it would be commercially valueless.

Thirdly, in any type of molding equipment whether for wood pulp or foam polystyrene, the article to be molded must have such configuration that it may be removed from the mold without undue effort or destruction.

None of the foregoing singly, or in totality, is or are enough to exclude polystyrene from the coverage of Claim 1 of Reifers '094. As pointed out under the next topic, Infringement, polystyrene performs in the same way, to produce the same results—in other words, is an equivalent. Anticipatorily, however, the following factors should be considered:

1. As pointed out above, the trade considers that Reifers '094 covers polystyrene (when of similar configuration) by accepting licenses under Reifers '094 for molded pulp and polystyrene:

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[48] File Wrapper No. 1, p. 38.

Packaging Corporation of America, January 1. 1969, Plaintiff's Exhibit 167; and

Container Corporation of America, April 1, 1969, Plaintiff's Exhibit 168.

Secondly, the interchangeability of molded pulp and polystyrene is recognized in the very patent under which Dolco manufactures the accused cartons—Snow 3,398,875. The Abstract of the Disclosure refers to egg cartons generally, without reference to material. The patent itself states:

> "Egg cartons are made to nest and have their bottoms and tops of approximately the same depth. When *molded foam pulp or a plastic of about the same stiffness as pulp . . .*"[49]

The specifications contain no reference to material. The claims each refer to a "molded carton" without further description of its material.

Thirdly, in Snow Patent No. 3,603,499, issued September 7, 1971, Snow states (Col. 1, ls. 64-66):

> "The egg carton shown in the drawing is molded from foam pulp or a suitable plastic, polystyrene foam being a preferred example . . ."

Fourthly, the Patent Office classifies Snow 3,398,875, Snow 3,603,499, Reifers '094, and the Commisso (Mobil) Patent No. 3,337,110[50] for a carton from paper pulp or foam plastic in Class 299 (Paper Recepticles) subclass 2.5 (Pressed).

Again, pulp is the preferred material, with polystyrene as a substitute equivalent.

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[49] Plaintiff's Exhibit 30; Col. 1, ls. 50-53. Note that molded pulp is first mentioned, with plastic as a second choice, or equivalent.

[50] Plaintiff's Exhibit 56.

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2. *Infringement—Equivalence—Law.*

Plaintiff does not contend that Reifers '094 covers *every* plastic egg carton. It does contend that the accused polystyrene is the equivalent of the carton covered by Claim 1 of Reifers '094. With this the Court agrees, on the basis of the grounds hereinafter considered. These grounds include the similarity if not identity of the configurations (geometry); the fact that the accused carton was designed with knowledge of Reifers '094; that Dolco never did consider making a carton with a lock different from Reifers'; Dolco's advertising of the Reifers lock as revolutionary and foolproof; the interchangeability of the cartons; their similarity of action when loaded with eggs; and the absence of any significant difference between the two.

(a) Similarity Of Configuration (geometry).

A visual examination of the Reifers carton and the accused carton will show their striking physical and functional similarity, and particularly the similarity of the cover with the female receptacles and holes, and the flap on the tray, with the male members or lugs or buttons, the locking being from the inside out. Further comparison would seem to be unnecessary in view of Defendant's concession:

> "Purely for the purposes of argument it may be conceded that the contours and dimensions (persistently referred to by plaintiff as the 'geometry' of the carton) and the respective modes of operation of the two cartons are quite similar. But even if they were absolutely identical, this fact would not provide an excuse for the application of the doctrine of equivalents . . ." [51]

For this contention Defendant relies upon International Latex Corp. v. Warner Bros. Co., 276 F.2d 557 (2 Cir.

[51] Defendant's Reply to Plaintiff's Main Brief After Trial, 16.

1960); Parke, Davis & Co. v. American Cyanamid Co., 207 F.2d 571 (6 Cir. 1953); and Slayter & Co. v. Stebbins-Anderson Co., 117 F.2d 848 (4 Cir. 1941). None of these supports Defendant's position.

In *International Latex,* plaintiff's patent was for a latex girdle "the external surfaces . . . being smooth and the inside surfaces thereof being of a slightly roughened matted character." This language was the result of an arduous experience in the Patent Office, and was expressly required to overcome cited prior art. The court held that this was not infringed by a latex girdle in which flocking had been inserted, instead of roughening the latex itself.

In *Parke, Davis,* plaintiff sued defendant for alleged infringement of its patent for an antianemia vitamin product. The claims called for an acid "derived by autolysis of mammalian liver tissue . . ." In its application plaintiff had endeavored to obtain claims not limited to this specific derivation, e. g. "obtainable from" or "a constitment of" or "derivable from mammalian liver tissue." The Patent Office required the use of "derived." Plaintiff yielded, and the claims so amended were allowed.

The court held that under these circumstances defendant's product which was a "chemical compound identical with that described in the patent but . . . is made from different starting materials and by an entirely different process from the product of" plaintiff, and "not derived from mammalian liver tissue nor from any animal product" was not infringing. [52]

In *Slayter & Co.,* the patentee's preferred blown wall insulation was comminuted corncobs and plaster of paris. The court held that although the patent was void for lack of invention, even if valid it would not have been infringed by the substitution of old for new.[53]

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[52] 207 F.2d at 573.

[53] The converse—new for old—is considered later.

(b) The Accused Carton Was Designed With Knowledge of Reifers '094.

That Snow, the patentee in Patent No. 3,398,875 under which the accused carton is licensed to and made by Dolco, was familiar with Reifers '094 before Snow designed his carton is clear from the evidence. (Transcript p. 1982).

> "Q. [By Mr. Brinkman] Mr. Snow, I believe in a question asked by the Court, you testified that before the design of your carton was finished, you became familiar with the patents in the egg carton field, is that correct?
>
> "A. [Mr. Snow] Yes, I did.
>
> "Q. [By Mr. Brinkman] I will show you herewith a copy of a patent which is the patent in suit, Reifers patent 2,990,094, Plaintiff's Exhibit 19, and I will ask if this was among the patents that were considered at that time.
>
> "A. [Mr. Snow] Yes, it was."

This makes it difficult to understand how Defendant could seriously argue [54] that Hoeltke v. C. M. Kemp Mfg. Co., 80 F.2d (4 Cir. 1935) is "readily distinguishable, one outstanding difference being that in *Hoeltke* the patented device had been submitted to the defendant and it designed its alleged avoidance with that device before it."

That Dolco recognized the risk involved in mnaufacturing and selling the accused carton, is seen by the fact that "Dolco was advised, as Portco [55] had been, that its cartons do not infringe the Reifers patent." [56]

(c) Dolco Never Considered Making A Carton With A Lock Different From Reifers' Lock.

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[54] Defendant's Reply to Plaintiff's Brief After Trial, p. 16.

[55] Assignee of Snow Patent No. 3,398,985.

[56] Defendant's Reply to Plaintiff's Main Brief After Trial, p. 22.

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Pretrial Order, par. 30:

> ". . . DOLCO never did consider making an egg carton with a different type lock from the one on the accused carton . . ."

Pretrial Order, par. 4:

> "Dolco says that it has 'refused to respect' the patent in suit."

Defendant's Reply to Plaintiff Main Brief After Trial, p. 21:

> "The true facts of the case are that *Dolco never attempted to design an egg carton to avoid the Reifers patent.*"

(Emphasis in original).

(d) Dolco Advertised The Reifers Lock as "Revolutionary" and "Foolproof."

(i) Revolutionary.

In the lower left hand corner on page 4 of the twelve page brochure of Dolco [57] entitled "How To Order Your Own Kool-Pak Cushion—Foam Egg Cartons" appears a picture showing a button of the Dolco carton protruding from the inside out through the round opening in the front cover beneath it the caption:

> "Revolutionary Easy Lock works perfectly with existing closure equipment to fasten lids firmly in place."

(ii) Fool proof.

In advertisements Plaintiff's Exhibit 46 and Plaintiff's Exhibit 47 appear sketches of the outside of a two button carton, with arrows pointing out the two button locks, accompanied by the slogan:

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[57] Plaintiff's Exhibit 45.

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"Patented 'Easy Lock' proven fool proof works perfectly on existing equipment."

The importance and value of the locking construction could scarcely be more strongly indicated.

As has heretofore been mentioned, on November 18, 1968, an inquiry [58] was directed to Dolco with respect to the "patent number which covers this 'Easy Lock' feature." The inquiry continued:

"We are, of course, very familiar with Diamond National Corporation's Patent No. 2,990,094 otherwise known as the Reifers' Patent, so if you are operating under license from Diamond National under this particular patent, then, a simple statement to this effect will suffice to answer this inquiry.

"If you are operating under a 'patent applied for' status, then, I believe that your advertising should be corrected to so indicate."

On December 27, 1968, counsel for Dolco (who are trial counsel herein), replied [59] in pertinent part:

"Upon inquiry, I find that the word 'Patented' appeared without intention of threat or warning to the trade but only with the intention to illustrate various attributes of the Dolco carton. To avoid possibilities of confusion or misunderstanding of intent, the wording which prompted your inquiry is no longer being used in the Dolco advertising."

Defendant disingenuously, if not dishonestly, now tries to explain the questioned advertising by saying: [60]

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[58] Plaintiff's Exhibit 59A.

[59] Plaintiff's Exhibit 59D.

[60] Defendant's Reply to Plaintiff's Main Brief After Trial, p. 25.

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> "It is highly significant that Mr. Snow was granted United States Patent No. 3,398,875 (PX 30) for his carton construction. The claims of this patent cover the novel relationship of the flap, cover, buttons and holes of the carton and it is this Snow patent under which Dolco is licensed, that was referred to in the Dolco advertisements."

Snow Patent No. 3,398,875 was issued on June 27, 1968, on application filed December 30, 1966. If in fact counsel believed it covered the advertised carton, that would constitute a legitimate "threat or warning to the trade," and there not only would be no reason why "the wording" was "no longer being used in the Dolco advertising," there would be every reason why it should be, but with "Patent Pending" before June 27, 1966, and with the patent number thereafter. If Snow 3,398,875 covered the carton, notice of the patent *should* be given.

A strong argument can be made that the advertisements and counsel's letter of December 27, 1968, were a recognition that the carton with the lauded "revolutionary" and "fool proof" lock was indeed patentable; and patented—but by Reifers, not Snow.

(e) Interchangeability of Accused And Reifers Cartons.

That the Dolco and Reifers cartons are fully interchangeable on packaging machinery, and that this is so in general use, is not disputed.

> ". . . The design of the [DOLCO] carton was dictated, however, by the fact that it had to operate on existing Page—Detroit [Diamond] machines and had to run ininterchangeable with other cartons because some users dictated the carton in which their eggs were to be packed (R. p. 1921)."[61]

* * * * * * * * *

[61] Defendant's Reply to Plaintiff's Main Brief After Trial, p. 23. Bracketed material added.

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From Dolco brochure:[62]

"Will my equipment handle Kool-Pak cartons?"

"Yes. Kool-Pak cartons run well on all major egg handling equipment, including standard pulp belt line closers and in-line closers. When adjustments are necessary for peak efficiency, our field service engineer will handle the adjustments for you. These adjustments are very minor and allow you to run Kool-Pak cartons interchangeably with pulp side close cartons at top speeds . . ."

* * * * * * * * *

Paragraphs 16 and 17 of the Pretrial Order:

"16. The accused cartons are 'fool proof' and 'work perfectly on existing equipment,' which includes DIAMOND'S closer which automatically closes DIAMOND'S cartons. DOLCO proved to itself that the DOLCO carton is 'fool proof' and 'works perfectly on existing equipment,' which includes DIAMOND'S closer.

"17. With very minor adjustments on egg handling equipment, including standard pulp belt line closers and inline closers, the DOLCO Kool-Pak cartons can be run interchangeably with pulp side close cartons including DIAMOND'S molded pulp cartons."

* * * * * * * * *

Paragraph 19 of the Pretrial Order:

"19. There was a time when MFE was using both DIAMOND'S cartons and DOLCO cartons."

* * * * * * * * *

Paragraphs 28 and 29 of the Pretrial Order:

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[62] Plaintiff's Exhibit 45.

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"28. MFE sells the accused cartons to the same customers to which MFE previously sold DIAMOND'S cartons. These customers include Schafer Bros. and farmers and the sales to these customers of the accused cartons are in the same manner as MFE had previously sold DIAMOND cartons. MFE's sales of such cartons without eggs in them are only nominal.

"29. In responding to plaintiff's inquiry [Interrogatory No. 59] as to whether MFE did supply the same cusotmer with eggs packed in some of DIAMOND'S cartons and with eggs packed in some of DOLCO'S cartons, the defendant states:

"Yes. When MFE started using Dolco's cartons it still had on hand a quantity of Damond's cartons. MFE found a strong preference for Dolco's cartons among its customers. In order to use up its inventory of Diamond's cartons, MFE followed the policy of including one or more Diamond cartons with a shipment of MFE cartons where the customer would tolerate this. MFE cannot from its records determine in detail precise instances in which this was done."

(f) Similarity of Action of Both Cartons On Manual Operations.

As pointed out in *Walterhoefer* (289 F.Supp. at 555, 581, fn. 155) in addition to automatable filling and closing, egg cartons must be susceptible of manual opening, removal of eggs, and closing; and the lock must function satisfactorily no matter how few eggs remain, or their relative relation to each other, and to the front or rear of the carton. That is, the carton must open and relock satisfactorily even if there be no eggs in the front row, or if the front row, or the entire carton, be full. Physical examination, inspection and handling by the Court led to the unqualified opinion that from a functional standpoint the operation and functioning of the two cartons was equivalent.[63]

[63] Transcript 1458, 1466, 1473, 1469.

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Just as in *Walterhoefer*,[64] Defendant argues that the accused carton is constructed "so that the eggs resisted inward movement of the flap, making the carton more secure against accidental unlocking"[65] and "The cover was designed to be unlocked by *pulling away from the buttons* rather than by depressing the buttons. (It is appreciated that the Court has indicated that in its view the carton could still be opened by depressing the buttons. However, this particular mode of opening was accomplished by deforming the buttons and by someone who had spent literally weeks on end studying this type of carton . . .)"[66]

The Court expressed doubt that the eggs did in fact exert any pressure against the locking tab on the tray, and summarized its handling of the accused carton, loaded with eggs, as follows:

> "Excuse me. If the thing is important, and apparently it is, I think I have made it abundantly clear, but I will say for the record that I opened the carton in the way in which I opened molded pulp cartons, by pushing in the two knobs and raising the cover, and that I did not intentionally pull the cover forward in so doing, and that my fingers were around the corners so that while I could, of course, pull forward, it was not a grasping with the thumb and fingers, which would be the normal way, I think of pulling the cover forward; and that I did that twice, and that I had no difficulty in opening the carton in that way, or in reclosing it; and that it appeared satisfactorily locked after each closure."

It is suggested that the Court's conclusions, from observing and handling, were also pragmatically sound.

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[64] 289 F.Supp. at 555, 581.

[65] Defendant's Reply to Plaintiff's Main Brief After Trial, p. 23.

[66] Defendant's Reply to Plaintiff's Main Brief After Trial, p. 24. (Emphasis in original).

If the eggs were in fact pushing forward against the front flap, helping to hold it locked:

(i) It is doubtful if the carton could satisfactorily be closed by automation, since it would be necessary delicately to depress the flange, to spring the front side of the cover forwardly and to draw it down below the lugs before releasing it.

(ii) If the front row were empty of eggs, then on Defendant's theory the carton should not lock satisfactorily; but it did.

(iii) A shopper, seeing lugs that invite "Push me in" is going to do just that; and if the eggs prevent depressing the lugs, then the eggs themselves are going to be depressed and probably broken.[67]

(iv) If Defendant's contention were sound, the cover should contain a warning, such as: "Pull, don't push."

Aside from the obvious sensitivity displayed by this effort on the part of Defendant, it is significant that substantially the same argument was made, equally ineffectively, in Walterhoefer with respect to the accused molded pulp egg carton; showing the similarity between (equivalence of) the two accused cartons; one of foamed polystyrene and the other of molded pulp.

In *Walterhoefer* this Court held:[68]

The Reifers patent "is of substantial importance in the field of egg cartons, especially molded pulp egg cartons, constituting 'a valuable contribution to the art' entitling the patent 'to liberal treatment' "; citing Hoeltke v. C. M. Kemp Mfg. Co., 80 F.2d 912, 921 (4 Cir. 1936); Denominational Envelope Company v. Duplex Envelope Co., 80 F.2d 186, 187, 193 (4 Cir. 1935); Graver Tank & Mfg. Co., Inc.

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[67] Walterhoefer, 289 F.Supp. at 555.

[68] 289 F.Supp. at 579.

v. Linde Air Products Co., 339 U.S. 605, 70 S.Ct. 854, 94 L.Ed. 1097 (1950).

Even without "liberal treatment," the accused carton, on the facts and under the applicable law, is the equivalent of the Reifers carton, and infringes Claim 1 thereof.

THE LAW

In Graver v. Linde, supra, the issue was whether or not a patent claim for welding fluxes made predominantly of alkaline earth metal silicates covered welding fluxes made predominantly of managanese silicate, which is not an alkaline earth metal silicate. In holding that it did under the doctrine of equivalents, the court used what is probably the most quoted language explanatory to the doctrine.

> "In determining whether an accused device or composition infringes a valid patent, resort must be had in the first instance to the words of the claim. If accused matter falls clearly within the claim, infringement is made out and that is the end of it.
>
> "But courts have also recognized that to permit imitation of a patented invention which does not copy every literal detail would be to convert the protection of the patent grant into a hollow and useless thing. Such a limitation would leave room for—indeed encourage—the unscrupulous copyist to make unimportant and insubstantial changes and substitutions in the patent which, though adding nothing, would be enough to take the copied matter outside the claim, and hence outside the reach of law. One who seeks to pirate an invention, like one who seeks to pirate a copyrighted book or play, may be expected to introduce minor variations to conceal and shelter the piracy. Outright and forthright duplication is a dull and very rare type of infringement. To prohibit no other would place the inventor at the mercy of verbalism and would be subordinating substance to form. It would deprive

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him of the benefit of his invention and would foster concealment rather than disclosure of inventions, which is one of the primary purposes of the patent system.

"The doctrine of equivalents evolved in response to this experience. The essence of the doctrine is that one may not practice a fraud on a patent. Originating almost a century ago in the case of Winans v. Denmead, 15 How. 330, [56 U.S. 330, 14 L.Ed. 717] it has been consistently applied by this Court and the lower federal courts, and continues today ready and available for utilization when the proper circumstances for its application arise. 'To temper unsparing logic and prevent an infringer from stealing the benefit of the invention' a patentee may invoke this doctrine to proceed against the producer of a device 'if it performs substantially the same function in substantially the same way to obtain the same result.' Sanitary Refrigerator Co. v. Winters, 280 U.S. 30, 42, [50 S.Ct. 913, 74 L.Ed. 147]. The theory on which it is founded is that 'if two devices do the same work in substantially the same way, and accomplish substantially the same result, they are the same, even though they differ in name, form or shape.' Machine Co. v. Murphy, 97 U.S. 120, 125, [24 L.Ed 935] . . ."

(339 U.S. 607-608, 70 S.Ct. 855, footnote omitted).

The Fourth Circuit had previously expressed similar views in Hoeltke v. C. M. Kemp Mfg. Co., 80 F.2d 912, 921-922 (1935):

"The learned District Judge was of opinion that complainant was not entitled to invoke the doctrine of equivalents and must be confined to the exact device disclosed by his patent. In this we think there was error. Whether complainant's patent be treated as a pioneer or basic patent or not, he unquestionably made

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a valuable contribution to the art; and it is well settled that in such case his patent is entitled to liberal treatment. As said by Chief Justice Taft in Eibel Process Co. v. Minnesota, etc., Co., 261 U.S. 45, 63, 43 S.Ct. 322, 328, 67 L.Ed. 523: 'In the case before us, for the reasons we have already reviewed, we think that Eibel made a very useful discovery, which has substantially advanced the art. His was not a pioneer patent, creating a new art; but a patent which is only an improvement on an old machine may be very meritorious, and entitled to liberal treatment. Indeed, when one notes the crude workings of machines of famous pioneer inventions and discoveries, and compares them with the modern machines and processes exemplifying the principle of the pioneer discovery, one hesitates in the division of credit between the original inventor and the improvers, and certainly finds no reason to withhold from the really meritorious improver the application of the rule "ut res magis valeat quam pereat," which has been sustained in so many cases in this court.'

"The rule applicable is thus stated in the leading case of Winans v. Denmead, 15 How. 330, 342 [56 U.S. 330], 14 L.Ed. 717:

"Patentable improvements in machinery are almost always made by changing some one or more forms of one or more parts, and thereby introducing some mechanical principle or mode of action not previously existing in the machine, and so securing a new or improved result. And, in the numerous cases in which it has been held, that to copy the patentee's mode of operation was an infringement, the infringer had got forms and proportions not described, and not in terms claimed. If it were not so, no question of infringement could arise. If the machine complained of were a copy, in form, of the machine described in the specification,

of course it would be at once seen to be an infringement. It could be nothing else. It is only ingenious diversities of form and proportion, presenting the appearance of something unlike the thing patented, which give rise to questions; and the property of inventors would be valueless, if it were enough for the defendant to say, your improvement consisted in a change of form; you describe and claim but one form; I have not taken that, and so have not infringed.

"The answer is, my improvement did not consist in a change of form, but in the new employment of principles or powers, in a new mode of operation, embodied in a form by means of which a new or better result is produced; it was this which constituted my invention; this you have copied, changing only the form; and that answer is justly applicable to this patent.

"And the rule was applied and stated with great clarity by Mr. Justice Clifford in Union Paper Bag Machine Co. v. Murphy, 97 U.S. 120, 125, 24 L.Ed. 935, from which we quote as follows:

"Except where form is of the essence of the invention, it has but little weight in the decision of such an issue, the correct rule being that, in determining the question of infringement, the court or jury, as the case may be, are not to judge about similarities or differences by the names of things but are to look at the machines or their several devices or elements in the light of what they do, or what office or function they perform, and how they perform it, and to find that one thing is substantially the same as another, if it performs substantially the same function in substantially the same way to obtain the same result, always bearing in mind that devices in a patented machine are different in the sense of the patent law when they perform different functions or in a different way, or produce a substantially different result."

See also Marvel Specialty Company v. Bell Hosiery Mills, Inc., 330 F.2d 164, 174-175 (4 Cir. 1964); Specialty Equipment & Mach. Corp. v. Zell Motor Car Co., 193 F.2d 515, 518-519 (4 Cir. 1952).

For infringement the equivalent need not have been known at the time of the invention. Waterproof Insulation Corp. v. Insulating Concrete Corp., 153 F.Supp. 626, 631 and footnote 9 (D.Md. 1957).

> "An equivalent is no less an equivalent merely because it was unfamiliar at the time of the invention."

Technician Instruments Corp. v. Coleman Instruments, Inc., 255 F.Supp. 630, 641 (D.Ill.1966), aff'd 385 F.2d 391 (7 Cir. 1967).

The Court concludes that the accused carton performs substantially the same function in substantially the same way to obtain the same result as the Reifers carton, is an equivalent thereof, and infringes Claim 1 of Reifers '094.

3. *Alleged Unenforceability of '094.*

Defendant contends that in any event the '094 patent is unenforceable because of "fraud" practiced on the Patent Office in the prosecution of the patent. Apparently reliance is placed upon six alleged grounds:

(1) Misrepresentation as to the "Dogma of the Art" with respect to the location of the male and female members on pulp cartons shown in the prior art.

(2) Nondisclosure of Cox Patents Nos. 2,517,465, 2,637,-479 and 2,655,303.

(3) Nondisclosure of the pending Comstock patent application.

(4) Nondisclosure of existing closure machinery.

(5) Misrepresentation as to the commercial success of Cox '233.

(6) Misrepresentation of Plaintiff's search of the prior art.

(1) and (2) may be treated together. A recital of the contentions would unduly burden this opinion, since they are merely repetitious of the extensive arguments made, fully considered, and rejected in *Walterhoefer*, 289 F.Supp. at pp. 570-572. The Court has again considered these arguments and is still of the opinion that its conclusion therein expressed was and is correct—the conduct, whether of omission or commission attacked by defendant therein and Defendant herein does not constitute fraud or inequitable conduct.

In so concluding the Court has been fully mindful of the increasing liberality in determining what constitutes fraud upon, or inequitable conduct before, the Patent Office; e. g., Precision Instrument v. Automotive Maintenance, 324 U.S. 806, 818, 65 S.Ct. 993, 89 L.Ed. 1381 (1945); Charles Pfizer & Co. v. Federal Trade Commission, 401 F.2d 574, 579 (6 Cir. 1968); Beckman Instrument, Inc. v. Chemtronics, Inc., 428 F.2d 555, 564-565 (5 Cir. 1970).

(3) Defendant contends that at the same time that Reifers attorney argued to the patent Examiner that the Koppelman carton could not be made in a single molding operation, Plaintiff was prosecuting a patent on the "jet principle" that could be used to make Koppelman cartons. The "jet principle" patent, the Comstock patent, was issued as Patent No. 2,923,654 [69] on February 2, 1960, on application filed January 6, 1955.

Of course, the Reifers invention occurred, and his patent application was filed, well before Comstock.

The argument in the Patent Office that "intermediately positioned apertures cannot actually be formed simultaneously with the suction molding of the body of the carton"

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[69] Defendant's Exhibit 33.

was and is literally true. The fibers form the body of the carton by application of suction when the mold is immersed in the wet slurry. It is at this point that the air jetting occurs. As the patent states:

> ". . . Upon emerging from the slurry a phase ensues in which an air pressure jetting is performed on the wet layer adjacent the areas of the rough apertures resulting from nondeposition of fibers, and it is with this operational phase that the invention deals . . ." [70]
>
> * * * * * * * * *
>
> "Air jetting as mentioned above comes into play at the instant the face of the molding screen at the aperture area comes clear of the slurry . . ." [71]
>
> "Through the agency of pressure jetting and timing instrumentalities of the general character referred to, each of the molding heads is subjected to air jetting exactly at the conclusion of fiber deposition . . ." [72]

Under Comstock, the air jetting occurs at the conclusion of fiber deposition; i. e., immediately after the body has been molded. In the accused carton, the holes are punched immediately after the body has been molded by thermoforming.

There was no misrepresentation to the Patent Office.

(4) Defendant contends that Plaintiff failed to disclose to the Patent Office the existence of automatic machinery for closing existing molded pulp cartons.[73] There was no need to make such disclosure.

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[70] Defendant's Exhibit 33, Col. 2, ls. 7-12.

[71] Col. 2, ls. 17-20; Transcript 510.

[72] Col. 3, ls. 29-32.

[73] Defendant's Main Brief After Trial, 181-183.

While of course a satisfactory egg carton must be nestable and capable of automatic filling and closing, which requirements were met by Cox '233, none of the cartons prior to Reifers '094 was susceptible of satisfactory automatic *locking,*[74] or of subsequent manual opening and reclosing. It was to these last two aspects that Reifers directed his attention,[75] and in which lie his invention.

(5) Defendant claims that in the prosecution of the '094 patent, the Cox '233 patent was referred to as commercially unsuccessful, although 20,000,000 cartons had been sold. Cox '233, although not satisfactorily susceptible of automatic locking, was the best of its kind until the Reifers '094 appeared on the market. It immediately superseded Cox '233, and at the time of trial was being sold at a rate in excess of 1,400,000,000 cartons a year.

(6) Defendant further contends that in the prosecution of Reifers '094 the Patent Office was advised that a full search of the art had been made. This was true,[76] even although Reifers himself was not personally fully familiar therewith.[77]

CONCLUSION

1. Reifers '094 is valid.

2. The accused carton infringes Claim 1 of Reifers '094.

3. Plaintiff is not estopped or barred from enforcing Claim 1 of Reifers '094 against Defendant.

The foregoing opinion embodies the Court's findings of fact and conclusion of law, whether or not expressly so denominated. F.R.C.P. 52(a).

Counsel may submit an appropriate form of judgment within ten days.

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[74] 289 F.Supp. at 568.

[75] 289 F.Supp. at 552.

[76] 289 F.Supp. at 567.

[77] Possibly an advantage. See 289 F.Supp. at 552, fn. 3.

APPENDIX D

UNITED STATES DISTRICT COURT
D. MARYLAND

July 26, 1968.

As Amended Oct. 21, 1968.

Civ. A. No. 14510

DIAMOND INTERNATIONAL CORPORATION,
a corporation of Delaware

v.

HARRY C. WALTERHOEFER, JR., William C. Walterhoefer and John A. Walterhoefer, trading as Harry C. Walterhoefer & Sons, and Packaging Corporation of America.

R. DORSEY WATKINS, District Judge.

This is an action brought by Diamond International Corporation (by change of name from Diamond National Corporation, assignee of the patent in suit, and hereinafter sometimes "plaintiff") against Harry C. Walterhoefer, Jr., William C. Walterhoefer, and John A. Walterhoefer, trading as Harry C. Walterhoefer & Sons (distributors) and Packaging Corporation of America (manufacturer), hereinafter defendants or PCA, for alleged infringement of United States Patent 2,990,094 (Reifers '094) issued June 27, 1961, on a continuation of a copending application filed December 16, 1953, which in turn was a continuation-in-part of an application filed May 24, 1952, and abandoned, for a "Molded Pulp Egg Carton." The patent in question is a product patent.

The progress of the various patent applications was tortuous and protected, and the patent was allowed only after the Board of Appeals had overruled the disallowance by

the Examiner of Claim 23 (later Claim 25, and Claim 1 of similarly characterized.[1]

Nor has PCA been niggardly in its defenses as to validity, infringement and enforceability. It asserts invalidity under 35 U.S.C. sections 101, 102, 103 and 112; absence of invention because of contemporaneous development of a similar locking device; misrepresentations to the Patent Office and to the Board of Appeals; file wrapper estoppel; abandonment at time of public use; violation at time of public use; violation of section 2 of the Sherman Act by fraudulently obtaining the patent in suit and an attempt thereby to obtain power to exclude competition; and an attempt to monopolize a distinct relevant market in molded pulp egg cartons.

Defendants also filed a counterclaim for a declaration of invalidity and noninfringement; and after the decision in Walker Process Equipment, Inc. v. Food Machinery & Chemical Corp., 1965, 382 U.S. 172, 86 S.Ct. 347, 15 L.Ed 247, filed an amended counterclaim adding two paragraphs to their original counterclaim and seeking therein a dismissal of the principal suit on grounds of unenforceability of patent because of unclean hands and patent misuse, including violation of section 2 of the Sherman Act.

Background.

Whatever may be the correct answer to the question of "which came first, the chicken or the egg?", at all times relevant herein, there were millions of hens, and millions of dozens of eggs. The practical question was: "How can

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[1] Pre-pretrial conferences; pretrial conferences and orders; a trial of twenty-one court days and two days of oral arguments; a transcript of 3,222 pages with 273 plaintiff's exhibits and 249 defendants' exhibits and trial briefs of over 675 pages (taking only "Foreword" and text). If the instances in which a numbered page is faced by an unnumbered page, and if the appendice's pages, were added the number would well exceed 800.

these eggs be commercially transported, either to their ultimate destination, or to points of distribution?"

The chief commercial containers for the transportation of eggs were either paperboard (cardboard) or molded pulp containers or separators in which some thirty dozen eggs would be packed in a single container, separated by "egg flats" and egg "filler flats." Then began the manufacture of egg cartons, in which a dozen eggs would be placed in a container, packed thirty cartons to a container. The competition between paperboard cartons and molded pulp cartons was, and continued to be, severe, their sales being split roughly 50-50 as of the time of trial. Each needed to be automatable as to loading. Each had certain advantages and disadvantages. The paperboard carton would better accept ink and advertising material; it could be closed by staple, glue or cord; but it did not accord maximum protection to the eggs, and was not readily adapted to re-use. The molded pulp carton was much more readily susceptible to cell formation designed to support and protect the eggs, but it was relatively brittle, and presented problems of closure similar to the paperboard cartons. Flaps or lugs were difficult to automate, and tended to break or bulge. In general, no satisfactory automatable locking had been developed prior to Reifers '094 in a molded pulp carton.

In several instances a compromise had been sought to be effected, a molded carton being placed in a paperboard "sleeve" or container. Moreover, "tri-fold" molded cartons had been developed, in which a flange connected to the cover portion contained extensions to be inserted in apertures in the tray portions of the containers.

In general, locking devices for molded pulp cartons had proceeded on the basis of frictional closure by placing a flap between the lower container, or tray portion, of the carton and the contained eggs, the eggs together with the spring action of the flap being relied upon to cause a lock-

ing; or tabs,[2] usually in the upper, or cover, portion of the carton were inserted in slots or openings in the front of the tray portion. Some suggestions had occurred in paper patents that the lugs could be placed on a flanged portion attached to the tray and inserted into the cover portion. Variations as to whether the cover portion should be cellular or non-cellular (planar) also existed.

At the time the Reifers alleged invention was conceived, the most nearly commercially satisfactory molded carton was one which combined the physical structure of Cox Patent 2,771,233, issued November 30, 1956, on an application filed June 21, 1950, with the Sherman "Tab-Lock", Patent 2,587,909, issued on March 4, 1952 on application filed February 17, 1947. Cox '233 contained quite satisfactory egg cell formations in the tray, to which a flange was attached, and a non-cellular cover, with a flexible front side. The Sherman tab-lock had a tab-receiving opening between the cells in the bottom (tray) section, and an extension from the cover section with a locking tab for insertion into the opening in the bottom section.

Efforts to secure effective locking devices in molded pulp cartons had been the subject of numerous efforts by many inventors, including Cox, president of plaintiff, and others, to be mentioned in specific discussion of the prior art.

Where a tab or lug device, as distinguished from a frictional one (or adhesives, or staples, or string) was relied upon, in general the male member was on the cover, or a flange thereof, and the female member was in the tray. In these, and in the few instances in which the flange and male member were attached to the tray, and the female member was in the cover, the entry was *always* directed from the ouside in.

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[2] The tabs were referred to as the "male" members, and the slots or apertures as the "female" members.

When Reifers was employed by plaintiff, he was given two assignments, one of which was to design a satisfactory lock for a molded pulp egg carton. He had had no experience in the field of egg cartons, but had shown substantial ingenuity in the field of packaging containers. Without study of the prior art, but with a background of extensive practical experience in packaging, in about five months [3] he developed the product on which the patent in suit issued. His testimony as to the production of a working model, its disclosure and recordation of invention, is in the Court's opinion entirely satisfactorily supported by the evidence.

In substance, he took the Cox '233 patent, placed the male members (nobs, or lugs) on the flange hinged to the tray, the thrust of said male members being directed from the inside out, and inserted receiving notches (holes, female members) in the front wall of the cover portion. This permitted easy filling, by having the tray portion completely open, with the flange extended outwardly, and an easy closing by then pressing in the flange and rotating the cover over it. Upon release, the flange would spring outwardly, securely locking the cover; protecting the eggs; permitting release of the cover without harming the eggs, and also the opening, removal of some of he eggs, and manual reclosing. Simple—beautifully simple; and so obvious in the view of 20-20 hindsight v. [illegible]; and so completely missed previously by those "skilled in the art."

Moreover, simplicity, far from being an objection to invention, "may constitute its great excellence and value." Chesapeake & Ohio Railway Co. v. Kaltenbach, 4 Cir. 1938, 95 F.2d 801, 804; " * * * some of the simplest advances have been the most non-obvious." Van Veen v. United States, Ct.

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[3] Whether Reifers is an illustration of "the new broom sweeps clean" is an interesting, but not critical question. It may well be that, freed from the (unsuccessful) teachings of the "art", theoretical, paper and practical, he saw what was obscured by the generally accepted approaches.

Cl.1966, 151 USPQ 506; Webster Loom Company v. Higgins, 1882, 15 Otto 580, 105 U.S. 580, 591, 26 L.Ed. 1177; Eastern Rotocraft Corp. v. United States, Ct. Cl. 1966, 150 USPQ 124; Refractolite Corporation v. Prismo Holding Corporation, 2 Cir. 1941, 117 F.2d 806, 807; "It only remains now for the wisdom which comes after the fact to teach us that * * * [Reifers] discovered nothing, invented nothing, accomplished nothing." (Carnegie Steel Co. v. Cambria Iron Co., 1901, 185 U.S. 403, 446, 22 S.Ct. 698, 715, 46 L.Ed. 968).

The claims in question read as follows:

> "1. In an integral and nestable egg carton made of relatively flexible molded pulp, a cellular tray portion having a front side, a rear side, and two ends, an inverted dished cover hinged to said tray portion, means for latching said tray portion to said cover with a latch located above said tray portion and extending completely through said cover from the inside to the outside, said tray portion having its front side strongly tied to its rear side by a plurality of spaced cell-forming partitions extending generally parallel to said tray portion ends, said partitions acting as means for preventing spreading of said front side from said rear side, said tray portion including egg cells adjacent but below the latching means, said inverted dished cover having a planar top, a front side, a rear side, and two ends, said front side being connected to said rear side only by said two ends and said planar top so that the front side is relatively flexible and is not rigidly tied to said rear side intermediate the ends of said front side, said front side of said covers having an opening formed therein through which the latch is adapted to extend completely from the inside to the outside, said dished cover being hinged to said tray portion along its rear side, a latch holding flap hinged to the front side of said tray portion, the hinge line connection of said

cover with said tray portion and the hinge line connection of said latching flap with said tray portion being maintained parallel by said tying partitions even when the tray portion is loaded with eggs, said latch on said latching flap being located on one side of the said tray portion which is opposite to the side where the cover is connected to the tray portion so that both the cover and the latching flap are each connected to the tray portion when the carton is open, said molded pulp egg carton being integrally formed with the latching flap, the upper edges of the two sides and the two ends of the tray portion, the upper edges of he two sides and two ends of the cover generally in the same plane and with the latch extending downwardly from the underside of the latching flap which is hinged to the front side of the tray portion and said latch being relatively close to the tray portion as compared with the opening in the front side of the cover which is relatively remote from the tray portion; when the tray portion is loaded with eggs and the latching flap is turned upwardly and the cover portion is rotated in a direction to telescope over the latching flap, the two hinge lines are relatively immovable but the front side of the cover may flex, whereby the loaded egg carton may be latched by simply rotating the latching flap upwardly and inwardly and rotating the cover upwardly and around the latching flap while the structural features maintain the geomeric relation of the latch on the latching flap to the opening in the cover until the front side of the cover engages the latch on the latching flap and is cammed thereover until the latch on the latching flap registers with the opening in the front side of the cover whereupon the latch passes through the opening in the cover from the inside to the outside to effectively latch the carton.

"2. A nestable molded pulp egg carton in accordance with claim 1, wherein the opening in the front side wall

of said cover extends to the planar portion thereof and the latch on said latching flap is near the edge thereof which is remote from the hinge connection of the latching flap with the tray portion."

As will be seen, defendants seek to make much of the structural details, claiming that Reifers could simply have said that he claimed Cox '233 plus buttons and holes.[4] Later, as will also be seen, they say that Claim 1 is fatally defective for failing to include allegedly essential limitations of the specifications.[5]

Defendants argue invalidity under 35 U.S.C. sections 101, 102, 103 and 112. Preliminarily, it may be noted that defendants assume a heavy burden in view of the statutory presumption of validity (35 U.S.C. section 282), strengthened by the extended consideration given the application in the Patent Office (Universal, Inc. v. Kay Mfg. Corp., 4 Cir. 1962, 301 F.2d 140; Baker-Cammack Hosiery Mills, Inc. v. Davis Co., 4 Cir. 1950, 181 F.2d 550), and further strengthened by the allowance of Claim 1[6] by the Board of Appeals. (S. H. Kress & Company v. Aghnides et al., 4 Cir. 1957, 246 F.2d 718, 721).

35 U.S.C. section 101.

Defendants claim that the alleged invention is not "new and useful" and does not produce a "new, useful and unexpected result." The contention that the invention is not

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[4] Defendants' counsel even started to argue this, apparently seriously, but soon admitted that a claim so phrased would have been clearly invalid.

[5] This seems to be somewhat of a Procrustean bed approach, under which a patentee is damned for saying more than, or less than, an alleged infringer now says was permitted or required.

[6] Present claim 2 had been allowed by the Examiner, who, however, disallowed present claim 1. How a claim dependent on a disallowed claim can be granted is not clear to this court.

useful can be dismissed off-hand. Its commercial success is clearly established, and is admitted by defendants with attempted explanations and qualifications as to the reasons therefor. It was "new" in the ordinary sense that Reifers for the first time disclosed it. Defendants' main argument is that the result was not unexpected, and the stock citations are made of Richards v. Chase Elevator Company, 1895, 158 U.S. 299, 302, 15 S.Ct. 831, 39 L.Ed. 991; Great A. & P. Tea Co. v. Supermarket Equipment Corp., 1950, 340 U.S. 147, 152, 71 S.Ct. 127, 95 L.Ed. 162; Altoona Publix Theatres v. American Tri-Ergon Corp., 1935, 294 U.S. 477, 486, 55 S.Ct. 455, 79 L.Ed. 1005; Heyl & Patterson, Incorporated v. McDowell Company, 4 Cir. 1963, 317 F.2d 719, 722; Servo Corporation of America v. General Electric Company, 4 Cir. 1964, 337 F.2d 716, 719; Goldman v. Polan, Katz, 4 Cir. 1938, 93 F.2d 797, 799.

It is contended that Reifers and Cox '233 are identical except for the "buttons and holes"; and that buttons and holes are old. But buttons [or tabs] and holes had been tried by others, including Cox in carton PX-106 which in a general way corresponds to his '233 patent.[6a] It was only when the particular buttons and holes of Reifers were used in a particular (and different) manner and relation to molded pulp egg carton constituent parts that a new and unexpected result—a satisfactory self-locking carton—was obtained.

35 U.S.C. section 102.

The pertinent portions of this section provide that:

> "A person shall be entitled to a patent unless * * *
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> (b) the invention was patented or described in a printed publication in this or a foreign country or in

[6a] Cox did not illustrate the use of the tab-lock in his '233 patent.

public use or on sale in this country, more than one year prior to the date of the application for patent in the United States, or

(c) he has abandoned the invention."

In 1955, PCA commenced the sale of 3 x 4 [7] molded pulp egg cartons, with snap locks similar to those in the Reifers application, and in plaintiff's cartons which had been on the market since 1953. On or about December 3, 1956, PCA received notice of alleged infringement of the Cox '233 patent, and shortly thereafter discontinued the production of the 1955 carton. In December 1957, PCA introduced a new 3 x 4 flat top carton. PCA contends that as during the period 1955 to May 1958, Reifers had claims pending which called for constructions differing from the PCA cartons, the PCA cartons were in "public use" and a bar to Reifers.

The main argument is that although the PCA cartons used locking lugs on the flange portion hinged to the tray, which entered into holes in the front cover, from the inside out, Reifers called for space between the front cover and the eggs, and for the lugs to be positioned between the cells, while in the "PCA carton of 1955 the locking lugs formed on the flange were disposed in front of two of the cells in the front row of cells and at approximately the maximum girth of the accommodated eggs with the result that the eggs served as abutments for the lugs so as to retain the latter in locked positions within the openings. Thus, the eggs prevented depressing the lugs in order to open the cover of the PCA 1955 carton." [8]

Whether in fact the eggs did prevent "depressing the lugs in order to open the cover" is questionable. Defend-

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[7] 3 x 4 refers to the cell arrangements, in a twelve-egg carton, of three rows of four cells; 2 x 6 is two rows of six cells.

[8] PCA Brief of October 2, 1967, page 26.

ants' argument ignores the variation in the sizes of eggs.[9] It is doubtful, if indeed the lugs could not be depressed to open the cover, that the cover could be closed (satisfactorily) by automation, since it would be necessary delicately to depress the flange, to spring the front side of the cover forwardly and to draw it down below the lugs before releasing it. Moreover the housewife, seeing a carton with no instructions for opening, but with lugs that invite "Push me in" is going to do just that; and if the eggs prevent depressing the lugs, then the eggs themselves are going to be depressed.[10]

All this, however, would at the most go to infringement as to which it will further be considered, rather than to validity.

It is contended that the mere pendency of limited claims, not broadened until after the PCA cartons appeared, evidenced an intention to abandon a broad inventive concept, and that in any event failure to amend to reassert broader claims within one year of the first commercial sale of PCA's 1955 carton falls within the prohibitions of section 102(b) barring the issuance of a patent on grounds of a prior "public use." Exclusive reliance for these contentions is placed upon Victor Talking Machine Co. v. Brunswick-Balke-Collender Co., D.Del.1923, 290 F. 565, affd. 3 Cir. 1925, 8 F.2d 41 (per curiam) and General Electric Co. v. Hygrade Sylvania Corporation et al., S.D.N.Y.1944, 61 F.Supp. 476. Before taking up these cases, a consideration of the prosecution of the Reifers applications, and of other pertinent provisions of the patent laws, will be necessary.

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[9] According to the testimony, the classification of eggs into jumbo, extra large, large, small, etc. relates primarily to the weight per dozen of eggs, so that the size of each egg in the dozen need not be, and generally is not, identical. Defendants' argument also ignores the fact that although all eggs are oval, they may vary from nearly round to long ovals.

[10] With "depressing" physical consequences.

The original Reifers application was filed May 24, 1952 (PX-1) and was expressly abandoned December 17, 1953 after the filing on December 16, 1953 of a co-pending continuation-in-part application (PX-2) which was in turn expressly abandoned on April 24, 1957, after the filing on April 19, 1957 of a co-pending continuation application (PX-3) on which the patent in suit issued. All three applications disclose and illustrate the same type of molded pulp egg carton with minor variations from the illustrated embodiment in the first application. The patent in suit in the first paragraph references the earlier filed applications, and on February 17, 1959 the Patent Office held that "the subject matter presently claimed is entitled to the date of applicant's abandoned application" filed May 24, 1952.

Clearly, the manufacture and sale of PCA cartons beginning in 1955 was not more than one year prior to May 24, 1952 or even December 16, 1953. Were PCA correct in this approach, then the sale by plaintiff of molded pulp egg cartons in 1953 would be a "public use," and no applicant for a patent could safely manufacture the product sought to be covered by the patent earlier than one year prior to the (unknowable) issue date of his patent. Similarly, this approach would mean that no applicant could safely permit the issuance of a foreign patent more than one year prior to the issuance of his United States patent, section 102(b) making no distinction between public use or sale, and subject matter patented or described in a printed publication in this or a foreign country. However, the Patent Office ruled that the counterpart Shellmar Australian Patent No. 164,896, issued July 2, 1953, could not be applied against the Reifers application that matured as the patent in suit.[11]

In so doing, the Patent Office necessarily concluded that Reifers had met the requirement of 35 U.S.C. section 120 which in pertinent part reads:

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[11] Plaintiff's Exhibit 3, page 83.

> "An application for patent for an invention disclosed * * * in an application previously filed in the United States by the same inventor shall have the same effect, as to such invention, as though filed on the date of the prior application, if filed before the patenting or abandonment of or termination of proceedings on the first application or on an application similarly entitled to the benefit of the filing date of the first application and if it contains * * * a specific reference to the earlier filed application."

The only question therefore on this point is whether there has been an "abandonment" by Reifers of his right to Claims 1 and 2. The allowance of the original filing date is clearly an indication that the Patent Office thought there had been no abandonment. See Protective Closures Co., Inc. v. Clover Industries, Inc., W.D.N.Y.1953, 112 F.Supp. 342, 345.

Defendants urge that Victor Talking Machine Co. v. Brunswick-Balke-Collender Co. et al., D.Del.1923, 290 F. 565, affd. 3 Cir. 1925, 8 F.2d 41, "would seem squarely in point"; the "point" apparently being the contention that Reifers should have filed a broader claim readable on PCA's commercial sale of its 1955 carton within one year after PCA began such commercial sale. However, Victor was not an infringement suit, it was an interference suit brought under Revised Statutes, Section 4918 (now 35 U.S.C. § 291), and involved a claim stricken out of an application of April 4, 1911 and then sought to be copied into the same application in June 1915, from a patent issued January 11, 1910, for purpose of interference under Revised Statutes, 35 U.S.C. § 135, provides in part that:

> " * * * a claim of an issued patent may not be made in an application unless such a claim is made prior to one year from the date on which the patent was granted."

The holding in Victor that the failure earlier to copy the claim of the issued patent was an abandonment would seem inevitable, but irrelevant to this case.

Defendants also contend that the "rationale" of Victor "was subsequently followed in" General Electric Co. v. Hygrade Sylvania Corporation et al., S.D.N.Y.1941, 61 F.Supp. 476. The only similarity is that General Electric also dealt with abandonment, but in an infringement suit, with respect to claims relating to luminescent or fluorescent material enclosed in a lamp tube, or disposed in the path of spectral ray emission. In the course of the prosecution of the patent application filed December 19, 1927 the applicant had eliminated on August 28, 1928 "the references to luminescent material originally contained in the specification and Claims 16 and 17," and while "the original specification, including the paragraph on luminescent material, was restored by amendment on October 12, 1932, * * * claims 16 and 17 were not; that nothing further was added to the specification in relation to luminescent material until October 31, 1939, and no claim embodying luminescent material was part of the application between August 28, 1928, and October 6, 1939." (61 F.Supp. at pages 497-498).

This was held to be an abandonment of any claim to the use of luminescent material.[12]

Certainly Reifers' disclosure of his invention continued unbroken from the original application in 1952. It is prob-

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[12] Defendant does not cite Muncie Gear Works v. Outboard Marine and Manufacturing Co., 1942, 315 U.S. 759, 62 S.Ct. 865, 86 L.Ed. 1171, thus apparently agreeing with this court's opinion that that case merely holds that the subject-matter of claims in public use more than two years before such subject-matter was introduced into the specification, rendered claims drawn to such new subject-matter void. See 315 U.S. pages 761, 763, 768, 62 S.Ct. 865; and see Ransburg Electro-Coating Corp. v. Proctor Electric Co., Inc. et al., D.Md.1962, 203 F.Supp. 235, 247; affd. 4 Cir. 1963, 317 F.2d 302.

able that, although the claims were changed from time to time (none being allowed until the issuance of the patent), there always existed claims broad enough to cover PCA's 1955-1957 production.[13] However, this probability need not be further explored as where the original application contains an adequate disclosure of the invention finally claimed, there can be no effective intervening public use, Coats Loaders & Stackers, Inc. v. Henderson et al., 6 Cir. 1956, 233 F.2d 915, 925; Sears Roebuck & Co. et al. v. Jones et al., 10 Cir. 1962, 308 F.2d 705, 708; even where the rejection of narrow claims is followed by the allowance of a broader claim, Packwood Manufacturing Co. v. St. Louis Janitor Supply Co., 8 Cir. 1940, 115 F.2d 958, 962; King-Seeley Thermos Co. 1. Refrigerated Dispensers, Inc., et al., 10 Cir. 1965, 354 F.2d 533, 535, 539; Jacquard Knitting Machine Co. v. Ordnance Gauge Co., Inc., E.D.Pa.1957, 95 F.Supp. 902, 907; Technicon Instruments Corp. v. Coleman Instruments, Inc., D.Ill.1966, 255 F.Supp. 630, 641.

35 U.S.C. section 103, reads as follows:

> "A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made."

Defendants contend that the Reifers '094 patent is invalid in the light of either of two[14] patent combinations:

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[13] Claim 13 of the second application; PX-2, pages 34-35.

[14] Defendants had no such positiveness in the pretrial proceedings, in which great vacillation occurred in combination choices. While immaterial if the final choices are valid, the difficulty suggests not obviousness, but ingenuity on the part of the inventor.

(a) Cox patent No. 2,771,233 and Hunziker patent No. 1,354,042; or (b) Koppelman patent No. 2,093,280 and Cox patent No. 2,517,465.

(a) Cox patent No. 2,771,233 and Hunziker patent No. 1,354,042.

The Cox carton PX-106 made under the '233 patent is for the egg cell structure used in Reifers, but with the male members on the cover portion and the female members in the tray portion, the entry being from outside in. No further comments in this connection are necessary.

Hunziker patent No. 1,354,042 is for a "Cigarette Case," of thin sheet metal bent to form an enclosing box-like structure adopted to be opened up by a hingelike-action to permit cigarette packages to be inserted therein or removed therefrom. The sheet metal blank was formed with extensions 8 and 9 at its opposite ends. When folded, the end portions 8 and 9 and the wings (ends) would be thrown at approximately right angles to the flat surface of the blank, and the end extensions 8 and 9 form two cooperating edge-forming flanges; the edge of flange 9 being slightly offset at 9^a. Closing and opening are described as follows: [15]

> "The edge flange 8 is formed with a notch 10, and the offset portion 9^a of the edge flange 9 has an outwardly pressed boss 11 that is beveled on its upper side and terminates in a sharp shoulder. When the case is closed, the boss or lug 11 will cam itself into interlocking engagement with the notch 10, and to release the same from the said notch when it is desired to open the case, the flange 9 must be sprung inward by pressure from the fingers."

What was claimed was: [16]

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[15] Page 1, lines 70-80.

[16] Page 1, lines 109-110; page 2, lines 1-15.

> "A cigarette case formed from a single piece of sheet metal bent on a curve at its intermediate portion to form a bowed spring acting edge wall, tending to open the case, and with the two sides forming portions of the sheet at their edges and ends having cooperating lapping flanges, said edge forming flanges having yieldingly engaging interlocking elements, and one of said end forming flanges adjacent to the bowed edge of the case, having a passage that is always open when the case is closed, to permit the endwise discharge of cigarettes, one at a time, all of the other edge forming flanges having curved ends located immediately adjacent to said bowed edge of the case, substantially as described."

The Hunziker patent is for a cigarette case. The claim does not refer to a lock, and the lock certainly was not an object of the patent.

The court is familiar with the increasing liberality with which courts have treated or applied "analogous arts" in considering obviousness. (Graham v. John Deere Co., 1966, 383 U.S. 1, 19, 35, 86 S.Ct. 684, 15 L.Ed.2d 545; Keyes Fibre Company v. Packaging Corporation of America, D.Del.1966 (not officially reported)). However, it is convinced that Cox '233 and Hunziker '042 do not make Reifers '094 obvious.

(a) The fields are certainly not reasonably analogous. While a question of closure is involved in Hunziker and Reifers, one relates to a metal container for cigarettes, the filling and emptying of which is specifically designed for manual operation. The other relates to a molded pulp carton for fragile objects, in which automated filling and manual emptying (with perhaps the removal of only one egg per opening), in primarily intended.

(b) How would a prospective patentee in the field of locks for molded pulp egg cartons ever learn of Hunziker

'042, Granted that if Hunziker '042 were an *anticipation*, every subsequent inventor would be charged with knowledge thereof, however obscure it might be, and whether or not reduced to practice—B. F. Goodrich Co. v. United States Rubber Co., D.Md.1956, 147 F.Supp. 40, 63, affd. 4 Cir. 1957, 244 F.2d 468; Western States Mach. Co. v. S. S. Hepworth Co., 2 Cir. 1945, 147 F.2d 345, 350; E. J. Brooks Co. v. Klein, 3 Cir. 1940, 114 F.2d 955—Hunziker '042 is not even remotely urged as an anticipation of Reifers '094. Would the most diligent of patenteees, seeking a locking device for a molded pulp egg carton, ever to be led to Hunziker '042? The Patent Office did not pick up, and never has picked up, Hunziker '042 as an element of anticipation or obviousness. The firm of attorneys, representing the present defendants, while representing Lambert (formerly Chief Engineer of Mapes, PCA's predecessor) did not discover Hunziker '042 in the prosecution of the Lambert Application Serial Number 512,055, filed May 31, 1955, since abandoned, for "Molded Pulp Egg Carton," for a patent now claimed by defendants to be for the same "invention" as Reifers '094. The Danish patent agents, Budde Schou & Co., consulted by attorneys for defendants, also did not pick up Hunziker '042.

In fact, Hunziker '042 issued in Class 206 "Special Receptacles and Packages," subclass 41 "Receptacles Pocket and Personal Use"—"Cigars and Tobacco"; is classified [referenced] only in Class 206, subclass 41; and is cross-referenced only in Class 22d, "Metallic Receptacles," subclass 62 "Blanks."[17] How even the most diligent appli-

[17] Certification dated February 9, 1968 from the First Assistant Commissioner of Patents, obtained, and to be filed as part of the record herein, in response to the Court's request on December 6, 1967 for a statement or certification of the classification, and cross-referencing, of Hunziker '042. Defendants criticize this certification as not relating to the period 1952-1953. The court would assume that a present classification and cross-reference would be at least as broad as those of 1952-1953. Defendants have offered no evidence or claim to the contrary.

cant in the field of molded plup egg cartons, or in any field other than Receptacles Pocket and Personal Use—Cigars and Tobacco—Metallic Receptables—Blanks—would have found Hunziker '042, or how defendants' counsel, after the abandonment of the Lambert application, found the reference, is on the record a complete mystery.

Reifers '094 is in Class 229-2.5.

(c) Even had Hunziker '042 been found, it is not apparent how a Patent Examiner, an applicant for a patent, or patent counsel (except after suit for infringement and years of cogitation) would have thought it to be pertinent —with or without Cox '233 or its equivalent. As defendants' expert (not himself an expert in the field of molded pulp egg cartons) admitted, Hunziker clearly was not concerned with the molded pulp industry, as it used metal blanks.[18] Hunziker had no flap, or hinged flange, on the "tray" portion, a feature indispensable in Cox '233 and Reifers '094 for purposes of automated loading and closing; and for safety loading. Opening in Hunziker was accomplished by pushing in the lug or a flange; and loading was to be from the side, not from above. The Hunziker locking system would be completely (commercially) impracticable in a molded pulp egg carton without serious modifications—e. g., a hinged flange on the "tray" section, which would not only not be suggested by Hunziker, but which would make Hunziker unworkable.

The court has been referred to no authority for the proposition that, and has a presently insuperable difficulty in understanding how, a device which requires a modification making it unworkable suggests such a modification in any field, let alone an unrelated one.

b. Koppelman patent No. 2,093,280 and Cox patent No. 2,515,465.

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[18] Transcript, 2451-2452.

The court is immediately impressed by the fact that defendants did not cite the Cox '465 patent in their original answer; that their counsel did not consider the Cox '465 as a deterrent to the Lambert application (supra and infra), but that non-disclosure of Cox '465 to the Patent Office is the strongest single element urged in their contention that fraud was practiced on the Patent Office. Again, if the combination of Koppelman '280 and Cox '465 does render Reifers '094 obvious, then the above factors are not controlling; but these factors do suggest the question of when obviousness is to be determined; at the time of the alleged invention, and the Patent Office procedure; or with the 20/20 (corrected?) vision of hindsight and advocacy.

Although there was no evidence that Koppelman '280 had ever been constructed, or that any one had ever seen a physical embodiment of such a structure, and although there was uncontradicted affirmative evidence that it could not be commercially made, defendants emphasize the presumption that the issuance of a patent is "some evidence of its operativeness". (Dashiell v. Grosvenor, 1896, 162 U.S. 425, 432, 16 S.Ct. 805, 40 L.Ed. 1025; Western States Mach. Co. v. S. S. Hepworth Co., 2 Cir. 1945, 147 F.2d 345, 348).

Koppelman purportedly discloses a molded egg carton made complete in a single molding operation; a cover and tray section, each cellular; a flap hingedly connected to the upper section; apertures preferably of holes through the front wall of the lower section; and that when forced between the eggs and the cups, the flap will be placed under tension, causing substantial frictional coaction, increased by the tendency of the flap to return to its original position.

Defendants then argue that inverting this structure would not unduly tax the ingenuity of one skilled in packaging articles such as eggs. As set forth,[19] defendants in this

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[19] Defendants' Brief of October 2, 1967, page 39, reads as follows, italics added:

"The Koppelman '280 patent is pertinent insofar as it discloses

argument have demonstrated considerably more "ingenuity" than Koppelman did, or intended. Interestingly, in the prosecution of the abandoned Lambert application Serial Number 512,005, counsel for the applicant, a member of the same firm of attorneys now advancing the argument that little ingenuity would be required to invert Koppelman, argued with equal earnestness that Koppelman did not provide for a camming action of the locking flap, and that this would be true even if Koppelman "were turned upside down." [20]

Furthermore, it is clear that Koppelman stressed the function of the eggs in effecting and maintaining the closure:

(a) an egg carton made complete in a single molding operation (page 1, column 2, lines 50 to 53); (b) a flap 12 hingedly connected to the front wall of *one of the carton sections* (page 2, column 1, lines 18 to 32); (c) an aperture 19 formed in the front wall of the *other* section (page 2, column 2, lines 7 to 9); and (d) that frictional coaction exists between the flap and the front wall of a *carton section* which is attributable *in part at least* to the tendency of the flap to return to its original position (page 2, column 1, lines 42 to 47)."

The specification *in fact* read (emphasis supplied):

"In the form of Figs. 1 and 2, a continuous flap 12 runs along the outer longitudinal edge of the *upper section 2* * * * so that the first user can on closing the carton * * * turn the flap in to a position substantially at right angles to its original position and *slip it inside* the outer forward wall *of the bottom section 1.* (page 2, column 1, lines 18 to 32).

"The apertures 19 are preferably holes extending through the *front wall of the lower carton section* * * *" (page 2, column 2, lines 7 through 9).

"This flap * * * *when forced between the eggs and their cups* * * * will be placed under tension and distorted slightly, *causing substantial frictional coaction* tending to hold it in this position. This frictional coaction is also *increased* by the tendency of the flap to return to its original position * * *" (page 2, column 1, lines 32 through 47).

[20] Plaintiff's Exhibit 5, pages 19-20.

"By the present improvements a locking device which not only takes advantage of the weight of the eggs and their pressure against the walls of the carton is provided * * * " (Page 1, col. 2, lines 41-44).

The flap "when forced in between the eggs and their cups and inside the connecting portions 6 * * * will be placed under tension and distorted slightly, causing substantial frictional coaction tending to hold it in this position * * * " (Page 2, col. 1, lines 37-42).

"[I]n which position they are held by the outward pressure of the flap and the pressure of the eggs in the adjacent cells against it * * *," (Page 2, col. 1, lines 71-74).

" * * * [T]wo of the most important features of" the present invention "reside in the construction and arrangement whereby the weight and pressure of the articles in the carton are employed in part to hold the closure and whereby the entire carton and its locking means may be made in a single molding operation." (Page 3, col. 1, lines 2-8).

Certainly gravity could not be inverted with the inversion of the carton, and "weight and pressure of the articles in the carton" could *not* "be employed in part to hold the closure."

The Board of Appeals, in reversing the Examiner's rejection of Reifers Claim 23 (now Claim 1) on Koppelman, very tersely considered and disposed of the inversion argument, saying:

"While Koppelman shows a pocketed tray portion, he does not show an inverted dished cover portion of the character claimed. To utilize Koppelman's carton in an inverted position would be contrary to the teachings of Koppelman since in Koppelman his locking de-

vice takes advantage of the weight of the eggs and their pressure against the wall of the carton * * * "[21]

As noted, defendants claim that by inverting Koppelman and adding the locking features of Cox '465, the Reifers carton was obvious. On the question of obviousness certain thoughts at once occur. If Cox '465 so clearly taught the Reifers lock, why is it that (a) Cox, who was familiar with Koppelman '280, did not himself invent the Reifers carton; (b) the Examiner cited, but did not rely on, Cox '465 in the first rejection of the first Reifers application [22] and apparently thought so little of it that it never again appears in the file wrappers of any of the Reifers applications [23]; (c) it was not cited as prior art in defendants' original answer to the complaint herein; (d) it did not deter the filing of the Lambert application; and Cox '465 was not noticed of record until December 1, 1965.[24]

Cox '465 does disclose (a) a locking flange 22 hingedly connected to the upper edge of the front wall of the tray section; (b) a locking flange carrying locking tabs 24 adapted lockingly to engage slots or openings 21 from the outside in, the engagement occurring above the top of the tray section; and (c) the location of the tabs when in locking engagement "preferably" being such that the "locking tabs will be partitioned between adjacent eggs." [25] although it is by no means clear that this would be the case in the structures shown in Figures 5 and 7. Also, Cox alternatively provided for the use of thermo-plastic adhesives to effect a closure.[26]

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[21] Plaintiff's Exhibit 3, pages 180-181.

[22] Plaintiff's Exhibit 1, page 30.

[23] A matter repeatedly stressed by defendants in the "Unclean Hands" defense against enforceability.

[24] Defendants' Motion to Amend.

[25] Column 3, lines 27 through 29.

[26] Column 3, lines 70; column 4, lines 6; and Figure 9.

The evidence is clear and uncontradicted that Cox '465 never went into commercial production [27]; the tabs had a tendency to "butt into the eggs on the inside of the carton;" [28] the tabs tore off, "you couldn't get them out, the front flap upon which the tabs were located had a very bad habit of bowing outwardly, even when the tabs were in the slots," and the inventor, Cox did "not believe anyone could develop a machine which would put those tabs in there." [29]

Defendants agree with the deficiencies of the Cox '465 for in the PCA patent 3,289,911 [30] it is stated:

> "With * * * the Cox [2,517,465] * * * carton there is a serious problem of accidental opening of the carton while it is being handled by the packer, merchandiser, or customer. In the Cox type carton a substantial part of the latching flap is exposed and thus susceptible to being accidently torn open. * * * "

Lambert "Contemporaneous" Effort.

Reifers conceived the alleged invention of the patent in suit on February 21, 1952, and immediately made a dis-

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[27] Transcript, 1836; 1965.

[28] Transcript, 2099-2100.

[29] Transcript, 1964. The court had previously questioned if '465 was susceptible to automation, saying (Transcript, 44-45):

"Of course, anything can be done; but what you would have to do is make an arc out of this fastening piece on the tray and then relax it and push it in at the same time and then straighten it out and I suppose that could be done by machinery, but it is in no way comparable to simply pushing in and closing the lid."

[30] To Boyd and Thaldorf, assignors to PCA, Plaintiff's Exhibit 179A, issued December 6, 1966 on application filed March 5, 1965 (column 1, lines 41-46). Applicants were represented by defendant's present Chicago counsel.

The inventors also question the reliability of the lock on the "Reifers style carton."

closure thereof to several officers of plaintiff; showed them a successful hand-made model; prepared written data of invention on March 3, 1952; and filed his first patent application on May 24, 1952.

Defendants contend that Lambert, PCA former Chief Engineer, developed a molded pulp egg carton utilizing a locking device "similar to that of Reifers and Hunziker at least as early as June 11, 1952." This is based upon an engineering progress and work report [31] dated July 14, 1952. In part this "progress and work report" reads as follows: [32]

> "A 2 x 6 egg carton has been designed to pack in the standard egg case. *A print of this carton is attached to this report. We believe that a satisfactory cover lock has been designed for this carton.* It may be opened and closed many times without damage to the lock or carton. When lifting the carton by the cover, the lock holds more securely due to the pinching action of the fingers. The carton may be easily opened for inspection of the eggs and the cover again locks securely when pressed back in place. *A hand-made sample of this carton lock was made for demonstration.* Designs for the pick-up mold and transfer are practically finished and work can be started on the experimental mold this week. Considerable thought and some ingenuity was required to design this mold, form the screens, mold the crease for folding the cover and to mold the lock and slot. The mold will fit the adaptor plates on our molding machines and can be molded on either the old or new machines at Griffith."

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[31] Defendants' Exhibit 139.

[32] Defendants' Post-Trial Brief, pages 46-47; Defendants' emphasis.

Lambert at first testified that he submitted a sample egg carton with a lock on it to the Board in July 1952, of the "type" of carton identified as DX-110-110A. A job card was prepared on which expenses attributable to experimental molds were entered. Lambert frankly admitted, however, that his 2 x 6 carton was not satisfactory, defendants contending that the decision not to go ahead was based on "commercial reasons." It would be difficult to find a better reason.

Defendants urge that the independent development of an idea or "invention" by several persons at or about the same time is evidence of obviousness, and that no invention was involved. (Concrete Appliances Co. v. Gomery, 1925, 269 U.S. 177, 185, 46 S.Ct. 42, 70 L.Ed. 222; Ruben Condenser Co. v. Aerovox Corp., 2 Cir. 1935, 77 F.2d 266, 268; Teleflex, Inc. v. American Chain & Cable Co., S.D.N.Y. 1967, 273 F.Supp. 573.) Defendants also contend that the filing of a patent application by Lambert on May 31, 1955, thereby asserting that Lambert's product was an invention, is not entitled to "great significance" in testing the validity of Reifers patent, relying exclusively on Houston Oil Field Material Company v. Claypool, 5 Cir. 1959, 269 F.2d 134. That decision, however, while holding that prior inconsistent conduct of a party "cannot control", also recognized that such conduct is "important evidence." That it is of "the highest degree of significance" see Ransburg Electro-Coating Corp. v. Proctor Electric Co., D.C.Md. 1965, 242 F. Supp. 28, 36; reversed on other grounds, Ransburg Electro-Coating Corp. v. Ionic Electrostatic Corp., 4 Cir. 1968, 395 F.2d 92.

In the Claypool case, the decision of the Fifth Circuit was founded primarily upon its conclusions that everything of significance claimed by the patentee had been disclosed in three prior patents, with no advantages shown in any departures therefrom; and that the patentee was barred by prior publication.

The Lambert claim of invention, moreover, is suspect. In the portion of the engineering and progress report, quoted above, it is stated that an "egg carton has been designed"; it is not said by whom. The record contains no testimony of any written data of invention. The "hand-made sample" allegedly "made for demonstration" has never been produced; and it appears to be conceded that no such sample was presented to PCA's Board, since Lambert testified on deposition that "Any samples submitted to the Board were molded" [33], and no molds were finished until February 8, 1953.[34] Lambert also testified on deposition that "the carton was not satisfactory, as you can probably see for yourself, that it is not a satisfactory carton." [35]

"An inoperable invention or one which fails to achieve its intended result does not negative novelty." (United States v. Adams, 1966, 383 U.S. 39, 86 S.Ct. 708, 15 L.Ed 572).

Moreover, Lambert did not file an application for a patent until May 31, 1955, more than three years after the Reifers application was filed, and some two years after the Reifers carton had commercially appeared on the market.

Under the circumstances of this case, the court finds as a fact, and concludes as a matter of law, that there is no satisfactory evidence that Lambert conceived a molded pulp egg carton with a lock similar to the Reifers lock, at or about the time of the Reifers conception; and that such lock by PCA's engineers, if in fact conceived in 1952, was impractical and does not negate the usefulness or novelty of the Reifers lock, or demonstrate that it was, or would have been, obvious to one skilled in the art.

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[33] Plaintiff's Exhibit 173-A, page 142.

[34] Ibid. page 145.

[35] Ibid. page 80.

State of the art—efforts by others.

The criteria to be applied in determining novelty were well stated by Judge Learned Hand in Ruben Condenser Co. v. Aerovox Corporation, 2 Cir. 1935, 77 F.2d 266, 268:

> "We should ask how old was the need; for how long could known materials and processes have filled it; how long others had unsuccessfully tried for an answer. * * *"

Expanded Metal Co. v. Bradford, 1909, 214 U.S. 366, 381, 29 S.Ct. 652, 656, 53 L.Ed. 1034:

> "It may be safely said that if those skilled in the mechanical arts are working in a given field, and have failed after repeated efforts, to discover a certain new and useful improvement, that he who first makes the discovery has done more than make the obvious improvement which would suggest itself to a mechanic skilled in the art, and is entitled to protection as an inventor."

Marvel Specialty Co., Inc. v. Bell Hosiery Mills, Inc., 4 Cir. 1964, 330 F.2d 164, 172:

> "In view of the apparent need which so long persisted, the obvious benefits to be gained by both the inventor and the industry from meeting the need, and the failure of anyone to meet it, we think the finding of patentable invention can be sustained even without considering the statutory presumption of validity."

Although for more than forty years there had been interest on the part of egg carton manufacturers, including PCA, in the manufacture of molded pulp cartons [36] it is only recently, despite optimistic forecasts, that the sales of the molded pulp egg carton have caught up with those

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[36] Pretrial order, page 4, November 22, 1966.

of the paperboard carton. Aside from the paperboard carton's superiority as to printing and decoration, the main problem faced by the molded pulp egg carton was that of automation, including, perhaps predominantly, automation of a means for satisfactory locking and unlocking.[37] As in the case of the paperboard carton, the molded pulp egg carton would have to be a good egg carrier; nestable; lockable in automation, and lockable and unlockable by the housewife.[38]

Included in the entrepreneurs were:

1. Winfield H. Mapes, Senior, active as an executive and director of Mapes Consolidated Manufacturing Co., PCA's predecessor corporation. He worked with Morris Koppelman (of '280 fame) in the development of a 2 x 6 egg carrier consisting of a cardboard box or wrapper with a filler and a top or bottom of a molded board "flat," or base or top. The patent[39] became an abandoned experiment.

2. Morris Koppelman. On November 23, 1927 Koppelman filed an application for his patent 1,846,561[40] for a 2 x 6 carton made "preferably by the pulp sucking or felting process", tri-fold, with a top with a front wall to be passed into slots to hold the cover in place. Again, there is no evidence that this carton ever appeared on the market, and it seems that Koppelman '280 was intended as an improvement.

3. William J. DeReamer, Chief Engineer of a predecessor of PCA, in which he was a substantial stockholder, had several patents, one of which, No. 2,061,064[41] was along

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[37] Transcript, 753, 769, 777; 1276; 1333; 2088.

[38] Transcript, 1955-56.

[39] Number 1,690,492; Px-73; Px-143.

[40] Px-143, Px-40-A.

[41] Px-6A; Px-40A; Px-143; No. 2,061,064, issued November 17, 1936.

the lines of Koppelman, in that a flap on the front edge of the cover was stuffed in alongside the eggs, the friction (hopefully) being sufficient to prevent accidental opening of the carton.[42] Another DeReamer patent 2,061,065, filed and issued on the same date as '064 [43] disclosed a 2 x 6 egg tray adapted to be inserted in a paperboard sleeve.

There was offered no evidence that either of the DeReamer cartons was ever produced commercially, although there is some evidence that the filler of '065 was produced experimentally.[44]

4. Francis H. Sherman, one of the founders of a corporation which after being succeeded by a second, was merged into plaintiff. He was a molded pulp egg carton designer, and the holder of a series of molded pulp egg carton container patents, including the patent on the Tab-Lock carton, No. 2,587,909 [45]; as well as a number of others. These included No. 1,975,127 [46] a molded pulp and paperboard carton, not produced commercially; No. 1,975,128 [47] a container or package for eggs, not in fact manufactured; No. 1,975,129 [48] which showed a metal clip, not at first, but later used; but the container was unsatisfactory except when placed in a paperboard sleeve.

A company later incorporated into plaintiff, from 1938 to 1942 tried to find locking means for molded pulp egg cartons, using rubber glues; thermoplastic glues; stitches; clips; staples.[49]

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[42] Ibid, page 2, column 1, lines 26-28.

[43] Px-15; Px-40A; Px-143.

[44] Px-174, pages 9-10; Px-171, page 9; Px-173, page 14.

[45] Px-40A; Px-143.

[46] Ibid.

[47] Ibid.

[48] Ibid.

[49] Transcript, 228-230; 241-242; 596-602; 1956-1957.

The Sherman patent No. 2,587,909 [50] for a molded pulp egg carton with tab-lock extending down from the front cover for insertion into the front of the container showed several forms of tabs. If successfully inserted, they tended to become disconnected in transit, and if not, to be broken by the first opening of the carton. These were sold from 1944 to 1950, and were not considered to be satisfactory locks.[51]

5. Lile H. Brown, engineer and designer for predecessor corporations merged into plaintiff, obtained a patent, No. 2,636,660,[52] on a molded pulp egg carton which had two tab-locks and a flap hinged to the front side of the tray, which flap could be set inside the cover.[53] The carton was never commercially produced.[54]

6. Harold S. Crane, now a vice-president of plaintiff [55], had been employed by corporations merged into plaintiff. He did quite a bit of experimentation with locks which was his "favorite indoor sport." [56] His patent 2,677,490 [57] was for a 2 x 6 molded pulp carton having two half covers, one to enclose each of two rows of six eggs, with locking tabs on the end of each of the half covers, the tabs folding around each end of the carton into holes in the tray. It was not commercially produced.[58]

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[50] Px-40A; Px-143.

[51] Transcript, 309-312.

[52] Px-40A; Px-143.

[53] Transcript, 343.

[54] Transcript, 527.

[55] A very impressive witness. The court has never seen a witness more meticulous in answering exactly, and only what, was asked.

[56] Transcript, 585.

[57] Px-40A, Px-143.

[58] Transcript, 528, 530.

7. Merle P. Chaplin, formerly Chief Engineer of Keyes Fibre Company, was a consultant generally to the industry and to a predecessor of plaintiff and then to plaintiff. Adjacent to his home he had a tool and die shop, an engineering department, a pattern making shop and a rather complete although small scale pulp preparation molding and finishing plant, with thirty to forty employees.[59] He obtained Patent No. 2,423,756 on a molded fibre article[60] consisting of a tray having two half covers inwardly, one having two half covers folding inwardly, one having two tabs extending from its upper surface for insertion into the other half. This effort "to provide a lock for" plaintiff did not constitute an adequate closure.[61]

8. Ruth M. Schilling produced a three-fold carton with a cellular inner cover and a tray-like outer cover. Patent No. 2,600,130[62] was introduced into the molded pulp egg carton field about 1950. Although the patentee endeavored to provide a frictional lock, it was completely inadequate[63], and was never sold commercially in this form, but in practice was glued shut.[64]

9. Walter H. Randall who succeeded Merle P. Chaplin and who was the chief engineer and director of research and engineering, and Vice President of Keyes Fibre Company, obtained Patent No. 2,578,739[65] for a 2 x 6 molded pulp carton having a cellular bottom tray portion and a dished upper cover. No lock is disclosed, but projections on the front edge of the cover would cooperate with re-

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[59] Transcript, 353-354.

[60] Px-40A; Px-143.

[61] Transcript, 1961; 349-351.

[62] Px-6J; Px-143.

[63] Transcript, 1965.

[64] Transcript, 1973; 1129.

[65] Px-1, page 30; Px-6I; Px-40A; Px-143.

cesses in the inner frnt edge of the egg holding section to resist the tendency of the free edge of the cover section to move outwardly when cartons were stacked, or otherwise subjected to downward pressure.[66]

There was no evidence that the Randall carton was ever produced or used commercially.

10. John W. Cox.[67]

For about eight years Cox represented Self-Locking Carton Company as its attorney, but his advice extended beyond the mere legal aspects. Self-Locking changed its name to General Package Corporation, and was merged with Diamond in 1956. From about 1939, Cox was head of operations of Self-Locking, and was intimately connected with the egg carton industry. His responsibilities included administration, sales, factory operations, research, engineering and all other functions of the company. He was quite familiar with the molded pulp processes, and was closely associated with the sale and use of egg cartons.[68]

Cox developed automatic egg room equipment used in egg packing plants, and also developed the "so-called continuous motion molded pulp machine, which still is the standard equipment used by" Diamond. Sixteen of these machines "have been constructed at a cost of about $2,-

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[66] Col. 3, lines 49-72.

[67] Cox was referred to in the highest terms by his associates, and recognized by his competitors as one highly skilled in the art. He made a very favorable impression on the court. He very lucidly described the problems of securing a satisfactory lock, the efforts he and others had made to solve the problems, and their lack of success.

Despite the lack of a good lock, Cox operated his various egg carton interests with financial success. The court appraised him as a man of pride, and of prudence in the expenditure of company funds. Certainly Reifers' solution was not obvious to Cox, who had repeatedly, and with some ingenuity, tried without success.

[68] Transcript, 2715.

000,000 a piece" and are represented by Cox Patents No. 2,879,696 and No. 2,881,679.[69]

In addition, Cox spent "countless hours cutting, shaping, gluing, packing, and otherwise trying to modify molded pulp cartons to try to come up with a commercially acceptable structure."[70]

When Cox first became associated with the egg carton industry, it was just entering automation. With the development of chain stores, supermarkets and other large egg outlets, it became necessary to pack eggs in twelve-egg cartons, which in turn were placed in thirty-dozen case lots.[71] The cartons, then of paperboard, were associated with an automatic set up, conveyor, packer and closer.[72]

Competition required that the molded pulp carton also lend itself to automation.[73]

Cox caused a search to be made in the Patent Office "to unearth every patent bearing on the subject" he "could scratch out" and was familiar with all of them.[74]

Cox devoted much time to the development of the 2 x 6 molded pulp egg carton, and enlisted the aid of his engineers. A number of patents were issued to him, reflecting some of these efforts. Patent No. 2,455,295[75] issued November 30, 1948 on application filed October 30, 1948 on application filed October 23, 1942 (when Cox was in the

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[69] Px-142.

[70] Transcript, 2716.

[71] Transcript, 1951.

[72] Transcript, 1954.

[73] Transcript, 1956.

[74] Transcript, 1957.

[75] Px-40A; Px-143.

Navy) in Cox's opinion licked "the problem of egg room pretty well, but * * * didn't have the sign of a cover lock for it."[76] It had abutments on the cover and body members, but they were intended to be associated with clips or other suitable means.

Another effort to provide a self-locking carton was Cox Patent No. 2,446,264, issued August 3, 1948 on application filed September 20, 1943.[77] This had an inner cover enclosing one-half of the eggs, and an outer cover, designed to snap over the inner cover and to provide frictional engagement. "It was not a secure enough lock, and could not be depended upon to secure the cover from coming off."[78] This was recognized by Cox, since the patent referred to fastening in a closed position, either by adhesives, or staples or clips.[79]

Another effort is represented in Cox Patent No. 2,466,-579, issued on April 5, 1949 on application filed September 20, 1943.[80] This called for a double cover that was supposed to lock into identations in the cross members. In practice it worked satisfactorily when empty, but was inadequate when filled with eggs.[81] Thermoplastic glue, or staples, were specified.[82]

Cox '264 and Cox '579 mentioned above issued from two of three applications sent by Cox from the Pacific and all filed on the same day, September 20, 1943. The third application matured into Patent No. 2,517,465 which issued

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[76] Transcript, 1962.

[77] Px-1, page 30; Px-6D; Px-40A; Px-143.

[78] Transcript, 1962-63.

[79] Column 3, lines 15-21.

[80] Px-40A; Px-143.

[81] Transcript, 1963.

[82] Column 3, lines 30-37.

August 1, 1950.[83] Patent No. 2,517,465 ('465—discussed in connection with the claim of misrepresentation to the Patent Office) was thoroughly covered by Cox in his testimony. It had a front flap attached to the bottom (tray) section to prevent the cover from telescoping over the bottom. Then, representing Cox's best thinking at the time, tabs were placed on the ends of the flap, to be inserted (from the outside in) into the slots in the front wall of the cover. On paper it looked good to Cox, but when he saw the actual construction, he recognized that "it was completely impossible." He doubted if a machine could be developed to insert the tabs. The tabs if manually inserted tore off; and the front flap would bow outwardly even if the tabs were inserted.[84] In fact, Figure 9 showed a way of locking the flap to the front wall by thermoplastic adhesive.[85]

Cox's summation was that "This carton was completely inadequate to meet any of our commercial requirements, and never went into commercial use." [86]

The Sherman Tab-Lock [87] was used by Self-Locking Carton Company from 1944 until the Reifers invention, although efforts did not cease to produce other cartons with other locks.

In 1950 Cox filed an application which matured into Patent No. 2,771,233.[88] This held and carried eggs well, and

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[83] Px-1, page 30; Px-6G; Px-40A; Px-143.

[84] Transcript, 1963-64. The court had independently reached the same conclusion from an examination of the patent.

[85] Column 3, line 71—Col. 4, line 5.

[86] Transcript, 1964-65.

[87] Sherman Patent No. 2,587,509; Px-40A; Px-143. The tabs extend downwardly from the cover, for insertion in the tray from the outside in.

[88] Px-3, page 83; Px-6M; Px-143.

fit into the thirty-dozen egg case. While the Sherman Tab-Lock was used on the carton as manufactured, Cox did not have much confidence in the Tab-Lock, and did not show its use in his patent application. Although relying in part upon frictional engagement of a flap hingedly connected to the tray position, with the forward cover wall, the specific sealing devices disclosed were staples or adhesives.[89]

In practice, a machine developed to lock automatically the Tab-Lock carton was abandoned; it broke too many eggs, and the tabs would break off.[90]

In January, 1952 Cox developed a Three-Fold carton [91] but it could not be satisfactorily stapled, and he went back to the (better, but not satisfactorily automatable) Sherman Tab-Lock.

"Between 1931 and 1952 in which, in spite of some fairly capable brains working on the problem, nothing came along which was satisfactory." [92] Cox felt it was necessary either "to improve the Tab-Lock or to go back to clips." [93]

Such was the state of, and the level of ordinary skill in, the pertinent art. (Graham v. John Deere Company, 1966, 383 U.S. 1, 86 S.Ct. 684, 15 L.Ed.2d 545.)

35 U.S.C. section 112. This section in pertinent part reads as follows:

> "The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention."

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[89] Column 5, line 38-47; 59-64.

[90] Transcript, 1971-72.

[91] Px-154.

[92] Cox, Transcript, 1974-75.

[93] Transcript, 1978.

Defendants urge that as primary objectives of the Reifers patent are said to be closing and locking of the carton without damaging the eggs by simple automatic machinery operating at high speed, and quick and easy manual unlocking without crushing the eggs, certain structural features mentioned in the specification should have been incorporated in the claims. (On April 9, 1965, in answer to Interrogatory 14 defendants stated: "The claims do not appear to be indefinite or uncertain under 35 U.S.C. § 112.") In part this argument is based upon the highly technical interpretation of the further provision of section 112 that the specification "shall set forth the best mode contemplated by the inventor of carrying out his invention." Reifers in the specification referred to certain objectives and virtues of the patent, and some structural features to be avoided. This portion of the specification is referred to as "indicative in a general way of the nature of the invention." The specification also states that "A singe embodiment of the invention is presented herein for purposes of illustration. However, the invention may be incorporated in other modified forms coming equally within the scope of the appended claims." (Column 3, lines 50-58.) While more apt language, to the effect that the carton described in the "preferred form" but that modifications may be made, could have been used, it is clear that Reifers intended to set forth, but not be limited to, the specific carton described, so long as the "invention" was embodied.[94]

More specifically, defendants refer to "structural features" under which the eggs do not function in respect to the making or maintenance of the interlock;[95] the existence

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[94] Common sense would indicate that an applicant, for purpose of securing his patent, would set forth what at that time he thought was the "best mode", whether or not those very words were used.

[95] Column 2, lines 6-8, 10-14.

of a substantial top space between the flange and the eggs and the placing of the lugs between the egg cells;[96] positioning of the locking lugs adjacent the top of the flange for reception in apertures adjacent the top of the cover;[97] "It is the spring of the flange at its stiffly stabilized hinge, coupled with its top flexibility, which are the key to the maintenance of the lock and to its ready disengagement when desired";[98] and the effect of the location of the locking apertures upon molding and stripping of cartons.[99]

Reifers could not have claimed the Cox '233 patent. In the court's opinion, the disclosure of the locking device (apart from the drawings) would have enabled one skilled in the art to apply it to any of several molded cartons then available (of which Cox '233 was one, if not the best one); and that the claims are accordingly adequate.

Defendants' reliance on Aluminate Co., Inc. v. Akme Flue, Inc., D.Md.1931, 50 F.2d 921; Technograph Printed Circuits, Ltd. v. Bendix Aviation Corp., D.Md. 1963, 218 F.Supp. 1, 44 aff'd per curiam 4 Cir. 1964, 327 F.2d 497, cert. den. 1964, 379 U.S. 826, 85 S.Ct. 53, 13 L.Ed.2d 36; and Henry J. Kaiser Co. v. McLouth Steel Corp., D.Mich. 1966, 257 F.Supp. 372, is misplaced. These were process patents in which the omission of an indispensable step from a claim would necessarily render it invalid.

Commercial Success.

Apart from the question of commercial success, the court finds the patent in suit valid. To the court, this is not a doubtful case, but if it were, commercial success would be significant. Technograph Printed Circuits, Ltd. v.

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[96] Column 2, lines 15-19; 21-30.

[97] Column 2, lines 31-38.

[98] Column 6, lines 55-59. Defendants' emphasis on this feature also emphasizes the inapplicability of Hunziker.

[99] Column 2, lines 40-50.

Bendix Aviation Corp., D.Md.1963, 218 F.Supp. 1, 51, aff'd per curiam 4 Cir. 1964, 327 F.2d 497; cert. den. 1964, 379 U.S. 826, 85 S.Ct. 53, 13 L.Ed.2d 36; Servo Corporation of America v. General Electric Company, 4 Cir. 1964, 337 F.2d 716. Defendants do not and could not deny the commercial success of the molded carton with the Reifers lock. The plaintiff, the defendants, Keyes Fibre Company, Packaging Corporation all produce cartons following the Reifers principles.

Defendants contend, however, that this commercial success is not attributable to the merits of the Reifers lock, but to the desirabiliy of molded cartons over paperboard (although the latest figures indicate about a 50-50 market) and to improvements in molded cartons other than the Reifers lock.

It is true that until the Reifers carton was in large scale production, plaintiff continued the sale of the Tab-Lock carton, although experiencing difficulty in large repeat orders. In 1958, three years before the Reifers patent issud, 500,000,000 Reifers cartons were being sold annually.[100]

Defendants also point to another patent to Reifers, No. 3,028,065 issued in 1962, and directed to a "Pillopost" construction, materially strengthening the carton and its contents against downward pressure, and removing the scalloped bays of the Cox '233 carton. The Pillopost carton was not produced commercially until the latter part of 1959[101]; and neither the defendants, nor plaintiff's licensees, Keyes Fibre Company and Molded Container Corporation, use the Pillopost construction.

Interestingly, defendants while challenging the importance of the Reifers lock to commercial success in connec-

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[100] Px-3, page 81.

[101] Transcript, 937.

tion with the question of validity, take a diametrically different view of the significance of the Reifers lock in defendants' anti-trust defense. There they say that "it was plaintiff's specific intent and purpose to get the Reifers patent by intentional fraud in order to monopolize that [the molded pulp egg carton] market"[102]; and that "The monopolistic *results* obtained by plaintiff since 1959-1960 confirm the intent with which it then acted to obtain its patent."[103]

The court finds as a fact, and concludes as a matter of law, that the commercial success of the Reifers carton supports the court's conclusion that the Reifers patent is valid; and were validity doubtful, such commercial success would turn the scales in favor of validity.

Unenforceability.[104]

Defendants contend the Reifers patent in suit is unenforceable (assuming its validity otherwise, and its infringement) because of the "unclean hands" of plaintiff. Although argued in three aspects—conduct in the patent office; conduct subsequent to the issuance of the patent, in the bringing of infringement suits; and violation of section 2 of the Sherman Act through an attempt to monopolize a part of trade and commerce in egg cartons—the fundamental question is whether or not the patent was obtained by fradulent means. If it were not, suits for infringement would simply be efforts to enforce legal rights associated with every valid patent; and the alleged "monopoly" would simply be the intended and necessary consequence of every valid patent.

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[102] Defendants' Post Trial Brief, page 139.

[103] Defendants' Post Trial Brief, page 149. Emphasis in original text.

[104] Ordinarily, having found validity, the next question would be infringement. In view of the way the case was presented and briefed, the court has elected to consider unenforceability before infringement.

Patent Office Procedure.

Defendants' approach, probably correct, is that if in the prosecution of the patent application, plaintiff intentionally made deliberate misstatements of fact, intended to influence the conduct of the Patent Office, this would bar enforcement whether or not the Patent Office was influenced by the alleged misrepresentations, and whether or not the patent in suit issued as a result thereof.

The alleged misstatements were those made to the Board of Appeals relating to the "dogma of the art," and to the inventions and teachings of Cox. Ultimately the major thrust of defendants' contention relates to the alleged nondisclosure or concealment of Cox '465.

Defendants refer to the brief and reply brief filed by plaintiff with the Board of Appeals [105] and quote the following positions:

1.

"COX, THE MAN SKILLED IN THE ART, FOLLOWING THE DOGMA OF THE ART, PLACED THE MALE LOCKING MEMBERS ON THE COVER AND FORMED THE PERFORATIONS OR COOPERATIVE FEMALE LATCHING MEMBERS IN THE TRAY" (p. 143.)

2.

"Cox already had the problem before Reifers' time, but Cox attempted to solve it in the manner shown in the Cox patents 2,529,140 and 2,739,750" (p. 146.)

3.

"Reifers radically departed from the dogma of the art and made the connection to the cover above the level of the tray. Cox, one of the most highly skilled

[105] Px-3.

men in the art, followed the practice of tying the cover to the tray at the level of the tray EVEN THOUGH COX ALREADY HAD A BRACING FLANGE (see element 48 of Cox patent 2,529,140)." (p. 147.)

4.

"The dogma of the art is to attach the male latching member to the cover, whereas applicant's latching flange is hinged to the tray so that the male latching member extends above the area where the eggs rest in their respective egg cells." (p. 150.)

5.

"Applicant's carton is the only carton in which the male latching member flange is secured to a first [the front?] side of the carton tray which is opposite to the side where the cover is hinged to the tray, which cover is formed with female latching openings." (p. 150.)

6.

"The dogma of the art was presented to the Examiner in the form of:

> "(1) the patent to Cox #2,529,140, which shows the cellular tray portion, the dished cover, the male latching members on the cover, and the cooperating perforations in the cellular tray as well as the bracing flap 48.

"This patent to Cox completely demonstrates that applicant's invention was unobvious to Cox, one of the most skilled men in the art.

> "(2) the patent to Cox #2,739,750 which shows in a tri-fold carton of the type of the Schilling patent that the best that could be done prior to applicant's invention was to place the male latching

members on the cover and the orifices 24 in the cellular tray." (pp. 170-171.)

7.

"The Examiner not only failed to mention the patents to Cox #2,529,140 and #2,739,750, which were specifically called to his attention, but completely ran away from this man skilled in the art * * *.

* * * * * *

"The work product of those skilled in the art made prior to applicant's invention must not and cannot be ignored by a fair and just tribunal." (p. 171.)

8.

"The Fourth Challenge Has To Do With The Examiner's Failure to Find In The Prior Art A Latchable Egg Carton Utilizing a Projection and a Perforation Wherein The Tray Portion is Imperforate."

"The Examiner has failed to meet this challenge." (p. 174.)

The Cox Patent No. 2,529,140 and Patent No. 2,739,750 showed the typical lugs on the cover and perforations in the tray. 2,529,140 also showed a bracing flange attached to the tray, and intended to be inserted behind the front wall of the cover. Here Cox had the materials for the Reifers invention—but he followed the general practice of putting the male members on the cover, and inserting them in orifices of the tray, from the outside in. Not mentioned were Cox 2,517,465; 2,637,479 and 2,655,303. In these the male members were on a flange or flap attached to the tray, the flap adapted to be on the outside of the cover when closed, and the male members intended for insertion into the cover. But the evidence is conclusive that none of these five was commercially produced, and that '465, '479 and '303 could not practically be automated [106].

[106] Transcript, 1149, 1245-46; 1836; 1964-65; 2103-04; 2107.

"An inoperable invention or one which fails to achieve its intended result does not negative novelty." (Henry J. Kaiser Company v. McLouth Steel Corp., E.D.Mich.1966, 257 F.Supp. 372, 388; United States v. Adams, 1966, 383 U.S. 39, 86 S.Ct. 708, 15 L.Ed.2d 572.)

Whether the term "dogma of the art" was the most apt term depends of course upon the meaning of "dogma" and "art." The art would seem to be that related to the production of molded egg cartons, not patents for molded egg cartons. In that aspect, the only commercially produced molded pulp egg cartons either had no molded locks, depending for closure upon friction, staples or glues; or had the (unsatisfactory) molded fasteners attached to the cover, for insertion into the tray from the outside in.

The Board of Appeals never once referred to the "dogma of the art." It considered the "art" relied upon by the Examiner—i. e., Koppelman and Schilling. It was impressed by the manner in which Reifers latched the cover to the tray, and the relationship of the elements as claimed.

There are other factors which lead to the conclusion that there was no intent to mislead the Board of Appeals, and that it was not in fact misled.

1. Examiner Ralston, who filed the Examiner's brief before the Board of Appeals, was fully familiar with Cox '465, as he had been with that application from the beginning to the end. Furthermore, Cox '465 had been cited by the Examiner in the prosecution of the first Reifers application, and this file had later been examined by Ralston in order to determine the effective filing date of Reifers. Otto v. Koppers Co., 4 Cir. 1957, 246 F.2d 789, 801 is pertinent. There Circuit Judge, now Chief Judge Haynsworth, speaking for the court said:

> "The patent in suit, however, was issued upon an application which was a continuation in part and con

solidation of several prior copending applications, in-one of which the Tiddy patent was cited. In the proceedings on the superseding application the Examiner (the same individual who had handled the earlier applications) was relying only upon Jeremiassen as being anticipatory, but reference was made to the earlier applications and *the claim that the Tiddy patent was not cited or considered as a relevant reference in the Patent Office cannot be sustained.* 35 U.S.C.A. § 120. See the opinion of Judge Soper in Gibbs v. Montgomery Ward & Co., D.C.Md., 19 F.2d 613, 616, affirmed 4 Cir., 27 F.2d 466." (Emphasis supplied).

2. Searches made by counsel, now counsel for defendants, either ignored Cox '465 or considered Koppelman to be the most important reference.[107]

3. Lambert in his patent application (discussed supra) represented by defendants' present attorneys, made the usual oath that he did not know that his "invention" had been patented or described in any printed publication in any country before his invention or discovery.[108]

4. Defendants in their answer to the complaint filed in the instant suit did not include Cox '465 in their citation of prior art.

In the foregoing discussion the court has been mindful of the principle enunciated in Denominational Envelope Co. v. Duplex Envelope Co., 4 Cir. 1935, 80 F.2d 186.[109]

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[107] Px-40A; Px-49.

[108] Px-5.

[109] The court's conclusion as to the effect of that case has been expressed in O.M.I. Corp. of America v. Kelsh Instrument Co., D.Md.1959, 173 F.Supp. 445, 458; Entron of Maryland, Inc. v. Jerrold Electronics Corp., D.Md.1961, 186 F.Supp. 483; Hanks v. Ross, D.Md.1961, 200 F.Supp. 605; and Technograph Printed Circuits, Ltd. v. Bendix Aviation Corp., D.Md.1963, 218 F.Supp. 1. See also S. H. Kress & Co. v. Aghnides, 4 Cir. 1957, 246 F.2d 718, 724.

If the court has in fact transcended the teachings of that case, only the plaintiff could, but will not, complain, since the court finds as a fact and concludes as a matter of law that there was no conduct by plaintiff, of omission or commission in the Patent Office, that would make the Reifers patent unenforceable.

In reaching this conclusion, the court has considered, but found inapplicable the cases cited by defendants.[110]

Conduct after issuance of patent * * infringement suits.

Defendants contend that as "plaintiff with undoubted knowledge of the patent's infirmity proceeded on a vigorous and comprehensive course of action by instituting law suits on the '094 Reifers patent in four widely separated geographical areas" [111] against its four competitors (Herkimer Pulp and Packaging Corporation, Molded Container Corporation, Keyes Fibre Company and PCA), it is barred from enforcing the patent. One of these suits was settled by the defendant therein taking a license; another, by an exchange of cross-licenses; a third has not come to trial; and the fourth is this suit.

Since the court has found there is no infirmity in the patent arising out of the Patent Office proceedings, plaintiff was and is entitled to sue any one who in good faith is believed to be an infringer. This truism was fully recognized by counsel for PCA before the existence of fraud had occurred to them. In 1961, when PCA was consider-

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[110] Kelstone Driller Co. v. General Excavator Co., 1933, 290 U.S. 240, 54 S.Ct. 146, 78 L.Ed. 293; Hazel-Atlas Glass Co. v. Hartford-Empire Co., 1944, 322 U.S. 238, 64 S.Ct. 997, 88 L.Ed. 1250; Shawkee Mfg. Co. v. Hartford-Empire Co., 1944, 322 U.S. 271, 64 S.Ct. 1014, 88 L.Ed. 1269; Precision Instrument Mfg. Co. v. Automotive Maintenance Machinery Co., 1945, 324 U.S. 806, 65 S.Ct. 993, 89 L.Ed. 1381; and Kingsland v. Dorsey, 1949, 338 U.S. 318, 70 S.Ct. 123, 94 L.Ed. 123.

[111] Defendants' Post Trial Brief, page 84.

ing taking a license from plaintiff, counsel for PCA (and one of its present counsel) advised PCA that there appeared to be a "strong case of infringement of the Reifers patent by" cartons manufactured by Molded and Herkimer, and recommended that in any license between PCA and Diamond "the latter agree to undertake the necessary action to prevent continued infringement by Molded Container Corporation and Herkimer Pulp and Packaging Corporation." [112]

Attempt to monopolize a part of trade and commerce in egg cartons.

Defendants' position is stated as follows: [113]

"Plaintiff, By Fraudulently Obtaining Its Patent and Asserting It, All With The Specific Intent To Obtain Power Thereby to Exclude Competitors, Was Guilty of An Attempt To Monopolize A Part Of Trade And Commerce In Egg Cartons Violative of Section 2 Of The Sherman Act"

Defendants cite Walker Process Equipment, Inc. v. Food Machinery & Chemical Corp., 1965, 382 U.S. 172, 86 S.Ct. 347, 15 L.Ed.2d 247. There the court said (pages 177 and 178, 86 S.Ct. pages 350 and 351):

> "Walker's counterclaim alleged that Food Machinery obtained the patent by knowingly and willfully misrepresenting facts to the Patent Office. Proof of this assertion would be sufficient to strip Food Machinery of its exemption from the antitrust laws.[5]

[5] "This conclusion applies with equal force to an assignee who maintains and enforces the patent with knowledge of the patent's infirmity."

[112] Px-48; Transcript, 2323.

This is not cited as constituting as estoppel to assert a defense of unenforceability in this case, but simply as a recognition of the right of a bona fide patentee to sue apparent infringers.

[113] Defendants' Post Trial Brief, page 84.

> By the same token, Food Machinery's good faith would furnish a complete defense. This includes an honest mistake as to the effect of prior installation upon patentability—so called 'technical fraud.'
>
> "To establish monopolization or attempt to monopolize a part of trade or commerce under § 2 of the Sherman Act, it would then be necessary to appraise the exclusionary power of the illegal patent claim in terms of the relevant market for the product involved. Without a definition of that market there is no way to measure Food Machinery's ability to lessen or destroy competition. It may be that the device—knee-action swing diffusers—used in sewage treatment systems does not comprise a relevant market. There may be effective substitutes for the device which do not infringe the patent. This is a matter of proof, as is the amount of damages suffered by Walker.
>
> "As respondent points out, Walker has not clearly articulated its claim. It appears to be based on a concept of *per se* illegality under § 2 of the Sherman Act. But in these circumstances, the issue is premature. As the Court summarized in White Motor Co. v. United States, 372 U.S. 253, 83 S.Ct. 696, 9 L.Ed.2d 738 (1963), the area of *per se* illegality is carefully limited. We are reluctant to extend it on the bare pleadings and absent examination of market effect and economic consequences."

The Court clearly states that for the defense to be available to an infringer, the patent must have been "obtained"[114] by knowingly and willfully misrepresenting facts to the Patent Office and that "good faith", including "an honest mistake" would not be sufficient. If this court

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[114] Whether the court in using the word "obtained" intended the sine qua non rule to be applied is not clear.

is correct in its conclusion that there was no fraud on the Patent Office, the patent is enforceable. But as so much time, labor and paper have been devoted to this question, especially by defendant, this court will, as briefly as possible, consider "the exclusionary power" of the patent "in terms of the relevant market for the product involved."

Defendants vehemently contend that the language immediately above quoted "did not mean, for a mere attempt, that an 'exclusionary power' in a 'relevant market' must *actually be found.* If the latter, however, must be taken as its true meaning, we submit that was not only *dictum,* but an inadvertent *dictum.*" [115]

Defendants contend that there must have been an inadvertent dictum because of the (asserted) distinction btween a complted monopolization in which the mere possession of exclusionary power in the relevant market is all that is necessary (with which position plaintiff agrees); and an attempt to monopolize, in which case defendants contend there need be only a specific intent to acquire exclusionary power over any substantial part of interstate commerce, not necessarily of any "relevant market"; and a dangerous likelihood of success. Plaintiff insists that the attempt must be with respect to a revelant market.

Defendants contend their position is entrenched in the law be decision after decision of the Supreme Court of th United States.

Defendants further contend that plaintiff did acquire "exclusionary power over the relevant distinct market for molded pulp egg cartons throughout the United States • • • " [116]

In support of their contention that in attempt cases the relevant market is not to be considered, defendants cite

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[115] Defendants' Post Trial Brief, page 115. Emphasis in original.

[116] Defendants' Post Trial Brief, page 118.

thirteent decisions of the Supreme Court. Of these, five [117] dealt with conspiracies to monopolize (in which it is sufficient if their be a conspiracy to monopolize "any part" of interstate or foreign commerce); one [118] is cited for the dissenting opinion; one was a price fixing case under section 1 of the Sherman Act [119] and three were monopolization cases.[120]

Of the attempt cases:

In Indiana Farmer's Guide Publishing Co. v. Prairie Farmer Publishing Co., 1934, 293 U.S. 268, 55 S.Ct. 182, 79 L.Ed. 356, the court held that it was not necessary to prove that defendants imposed a restraint that affected all commercial advertisements in all farm papers wherever published or circulated, since the provisions of sections 1 and 2 of the Sherman Act "have both a geographical and distributive significance"; and that control of 44.37 to 66.92 per centum of the total "in the territory properly to be taken into account" (278-279) would be sufficient to make a directed verdict for the defendants improper.

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[117] Swift & Co. v. United States, 7905, 196 U.S. 375, 25 S.Ct. 276, 49 L.Ed. 518; American Tobacco Co. v. United States, 1946, 328 U.S. 781, 66 S.Ct. 1125, 90 L.Ed. 1575; United States v. Yellow Cab Co., 1947, 332 U.S. 218, 67 S.Ct. 1560, 91 L.Ed. 2010; Mandeville Island Farms v. American Crystal Sugar Co., 1948, 334 U.S. 219, 68 S.Ct. 996, 92 L.Ed. 1328; Continental Ore Co. v. Union Carbide & Carbon Corp., 1962, 370 U.S. 690, 82 S.Ct. 1404, 8 L.Ed.2d 777.

[118] Hyde v. United States, 1912, 225 U.S. 347, 387-388, 32 S.Ct. 793, 56 L.Ed. 1114.

[119] United States v. Socony-Vacuum Oil Company, 1940, 310 U.S. 150, 60 S.Ct. 811, 84 L.Ed. 1129.

[120] United States v. Griffith, 1948, 334 U.S. 100, 68 S.Ct. 941, 92 L.Ed. 1236; United States v. E. I. du Pont de Nemours & Co., 1956, 351 U.S. 377, 76 S.Ct. 994, 100 L.Ed. 1264; Walker Process Equipment, Inc. v. Food Machinery & Chemical Corp., 1965, 382 U.S. 172, 177, 86 S.Ct. 347, 15 L.Ed.2d 247.

The "relevant market" was determined and appraised.

United States v. Columbia Steel Co., 1948, 334 U.S. 495, 68 S.Ct. 1107, 92 L.Ed. 1533, and Times-Picayune Publishing Co. v. United States, 1953, 345 U.S. 594, 73 S.Ct. 872, 97 L.Ed. 1277, each charged a combination or contract under section 1 of the Sherman Act and also alleged attempts to monopolize under section 2. The relevant market was examined under the section 1 charges, which charges the court found were not sustained. The court then inquired separately into the attempt charges, and found failure to establish a specific intent. This made it unnecessary to inquire into the "market" as to which the unproved attempt related.

In Lorain Journal Co. v. United States, 1951, 342 U.S. 143, 72 S.Ct. 181, 96 L.Ed. 162, the defendant newspaper sought to eliminate a competing radio station from the mass communications advertising market in an Ohio locality. The court considered the nature of the market in which defendant competed, the availability of substitutes, and the relative market position of defendant; and held that there was a dangerous probability that defendant would succeed in its attempt to regain its previously possessed monopoly.

Defendants also heavily rely upon "Antitrust Policy and The Cellophane Case" 70 Harv.L.Rev. 281 by Professor Donald F. Turner. He lumps attempts and conspiracies as such "egregious" conduct that any refined concept of market should be discarded and that each of these may be condemned per se. A somewhat similar approach is taken in an article in 25 George Washington Law Review 568 (1956).

On the other hand, in another article in 27 Georgetown Law Review 227 (1958) a directly contrary view is taken. The author asserts that in attempt cases there must be a relevant market as broad as that for a monopolization

charge, otherwise one could be punished for striving unsuccessfully for what, if accomplished, would be a legitimate goal, not a substantive offense. To the same effect is the paper presented at a subcommittee meeting of the Anti-Trust Section of the American Bar Association, 34 Antitrust Law Journal, 165-177. See also, Report of the Attorney General's Committee to Study the Antitrust Laws, 47 (1955).

Kellogg Co. v. National Biscuit Co., 2 Cir. 1934, 71 F.2d 662, cited by defendants, held that on motion to dismiss, allegations as to the institution of a suit to enforce an invalid trademark, and false representations as to the quality of a competitor's product, would if proved be sufficient.

United States v. Consolidated Laundries Corporation, 2 Cir. 1961, 291 F.2d 563 was a charge of conspiracy to monopolize, not monopolization, or an attempt to monopolize.

Lessig v. Tidewater Oil Company, 9 Cir. 1964, 327 F.2d 459, is the only case cited by defendants that directly holds that in an attempt (which the majority equated with conspiracy) no question of relevant market is involved. The main thrust of the 2-1 majority opinion was directed toward resale price maintenance, and exclusive dealing and trying arrangements. One page of the twelve page majority opinion deals in Part III with attempt to monopolize. The majority's concern over what it said in this connection is evidenced by its per curiam, following the dissent, in which after denying a petition for rehearing and motion of amicae curiae for leave to file a statement in support thereof, it is said:

> "The earnestness with which Tidewater suggests that Part III of the opinion may be read as rendering illegal any competitive effort to gain a share of available business leads us to add what might seem obvi-

ous: that Part III of the opinion is to be read with the remainder, and in the light of the anti-competitive purposes and conduct to which the case relates." 327 F.2d at 478.[121]

Different results were reached in the following district court cases:

American Football League v. National Football League, D.Md.1962, 205 F.Supp. 60; aff'd 4 Cir. 1963, 323 F.2d 124.[122] Chief Judge Thomsen apparently equated an attempt to monopolize with a combination or conspiracy to monopolize with a combination or conspiracy to monopolize, but held that in either event such conduct required the consideration of the relevant market to which the alleged conduct was directed. He said (205 F.Supp. 64-65):

"(b)-(c). *Attempt and Conspiracy.* There may be an attempt to monopolize, or a combination or conspiracy to monopolize, without the offender or offenders actually having monopoly power. But an essential element of an attempt to monopolize, or of a combination or conspiracy to monopolize, is a specific intent to destroy competition or build monopoly. Times-Picayune Pub. Co. v. United States, 345 U.S. 594, 626, 73 S.Ct.

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[121] The necessity to state what "might seem to be," but apparently was not, "obvious" indicates that the conclusion that no question of relevant market is involved in attempt cases is not a flat, or all-embrasive, conclusion.

[122] The Court of Appeals considered separately, charges of monopoly, attempt to monopolize, and conspiracy to monopolize. On the first, the Court of Appeals approved the District Court's approach to and determination of the "relevant market." (323 F.2d at 128-131). The Court of Appeals then considered the charge of attempt to monopolize (323 F.2d at 131-132) concluding, without specific use of the words "relevant market", that "* * * the District Court's finding is abundantly supported by the evidence * * *"

872, 97 L.Ed. 1277; United States v. Aluminum Co. of America, 2 Cir., 148 F.2d 416 at 432; American Tobacco Co. v. United States, 328 U.S. 781, 814, 66 S.Ct. 1125, 90 L.Ed. 1575. Neither rough competition nor unethical business conduct is sufficient. The requisite intent to monopolize must be present and predominant.

"The intent must be to gain control over some relevant market sufficient to set prices in that market or to exclude competitors therefrom. An intent to exclude competitors from only part of the relevant market would not be sufficient to create liability for an attempt or a conspiracy, unless as plaintiffs contend in this case, defendants believed that by excluding the AFL from certain cities, e. g. Dallas and Minneapolis-St. Paul, they could effectively exclude it from the entire market, and acted with that specific intent as their preponderant motive."

"Relevant Market"

"The market which must be studied to determine whether a business organization has monopoly power will vary with the part of commerce under consideration. United States v. E. I. du Pont de Nemours & Co., 351 U.S. at 404, 76 S.Ct. 994, 100 L.Ed. 1264; International Boxing Club of New York, Inc. v. United States, 358 U.S. 242, 249-251, 79 S.Ct. 245, 3 L.Ed.2d 270."

In United States v. Chas. Pfizer & Co., Inc., E.D.N.Y. 1965, 245 F.Supp. 737, the court refused to follow Lessig v. Tidewater Oil Co., 9 Cir. 1964, 327 F.2d 459; criticized the article by Turner, "Anti-Trust Policy and the Cellophane Case," 70 Harv.L.Rev. 281, 294; distinguished between attempt to monopolize (245 F.Supp. at 738-739), and concluded that "proof of the relevant market * * * was neces-

sary to the Government's claim of attempted monopolization * * * " (245 F.Supp. at 739).

In Becker v. Safelite Glass Corporation, D.Kansas 1965, 244 F.Supp. 625, in granting summary judgment on a charge of attempt to monopolize, the court thoroughly analyzed (244 F.Supp. 637-638) Lessig, supra, and held that in attempt cases, the "relevant market" is an issue. (244 F.Supp. at 637.)

It seems to this court clear, both on authority and logic, that when a charge is made of attempt to monopolize, the first question would be—"to monopolize what?" The answer would seem to be "the relevant market,[123] toward the monopolization of which the attempt was directed." Were this not so, there would be the anomaly that a defendant could be punished for attempting to do what, if accomplished, would be legal. That is, if a defendant in fact acquired a position in a relevant market that did not amount to monopoly, how could it be wrongful for a defendant to attempt, successfully or unsuccessfully to acquire that position—i. e., to try to do that which if accomplished would be valid?

The Relevant Market.

Defendants' position is that if relevant market is to be considered, such "relevant markets" are "the national and western area territorial markets for molded pulp egg cartons alone * * * "[124] Plaintiff contends that the relevant geographic market is the United States, and that the relevant product market is egg cartons, including both molded and paperboard types.[125] The court agrees with the plaintiff's position as opposed to that of defendants, but suggests that perhaps "commodities reasonably interchange-

[123] This discussion relates solely to attempts to monopolize. Whether the same principles would be applicable to combinations or conspiracies to monopolize, need not here be decided.

[124] Defendants' Post-Trial Brief, page 138.

able by consumers for the same purposes" [126] would include all types of egg cartons, but possibly subdivided into molded pulp egg cartons with the Reifers lock; all other molded pulp egg cartons; paperboard cartons; and all other egg cartons.[127]

The decided cases give no real help for an a priori determination of interchangeability. United States v. E. I. du Pont de Nemours & Co., 1956, 351 U.S. 377, 76 S.Ct. 994, 100 L.Ed. 1264, held cellophane competitive and interchangeable with other flexible wrapping materials, although having advantages over them. United States v. Paramount Pictures, 1948, 334 U.S. 131, 68 S.Ct. 915, 92 L.Ed. 1260, held that the market for first run pictures, with a guaranteed interval before the picture could again be exhibited in the same area, was distinct from the market in second and subsequent runs, just as it was held in International Boxing Club v. United States, 1959, 358 U.S. 242, 79 S.Ct. 245, 3 L.Ed.2d 270, that the "market" for championship boxing contests was different from that for all other boxing contests. United States v. Grinnell Corp., 1966, 384 U.S. 563, 86 S.Ct. 1698, 16 L.Ed.2d 778, held that insurance company—accredited central station protective services differed from other protective services not only in utility, efficiency, reliability, responsiveness and continuity, but that insurance rates were lower for properties protected by accredited services, and that nonaccredited central stations were generally regarded as inferior.

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[126] United States v. E. I. du Pont de Nemours Co., 1956, 351 U.S. 377, 395, 76 S.Ct. 994, 100 L.Ed. 1264.

[125] Citing Report of the Attorney General's National Committee to Study the Antitrust Laws (1955), page 45.

[127] Patent No. 3,289,911 (Px-72) to PCA, assignee of Boyd and Thaldorf, for a "Carton Construction" shows an illustrated embodiment of "molded paper-pulp", but states that "any of the illustrated cartons may be formed of thermo formed or molded plastic, press formed paperboard or any other suitable material • • •" (Col. 2, lines 62-63).

The court finds that in this case the relevant product market is egg cartons. As hereinbefore mentioned, molded pulp cartons and paperboard cartons have their respective advantages and disadvantages—but they are functionally interchangeable and are strongly competitive. While, molded pulp egg cartons had been on the market for more than twenty-five years, at the time of trial they had acquired not quite one-half of the market.[128] The same purchasers buy both kinds. A. & P.'s purchases are 50-60 per cent paperboard[129]; Safeway Stores 40-50 per cent[130] and Swift & Company somewhat under 50 per cent.[131] In fact several substantial customers of plaintiff had such unsatisfactory experiences with molded pulp egg cartons with the tab-lock that they went back to paperboard.[132]

The court further finds that, as all egg cartons are in direct competition, and egg cartons are in use throughout the United States, the relevant geographic market is the United States. Plaintiff has at least 23 competitors[133] selling or capable of selling nationwide. Plaintiff's percentage of the molded pulp and cardboard egg cartons in the so-called eleven-state Western area is high, but vulnerable to competition; but there is no reason to treat this as a special or separate area[134] and any other eleven-state area could be taken with different results.

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[128] 49.6%—Dx-135.

[129] Transcript, 974-981.

[130] Transcript, 981-987.

[131] Transcript, 988-989.

[132] Transcript, 771-773, 828, 882, 1005, 1006, 1021, 1025, 1026.

[133] Dx-211.

[134] Defendants have referred to infringement proceedings brought by plaintiff against Molded Container Corporation, and the settlement thereof, with Molded taking a license. Defendants stress the provision under which Molded is given a non-exclusive,

Defendants' contention that the Reifers patent was fraudulently obtained to create or perpetuate a monopoly is of course inconsistent with the claim that the commercial success is not due to the Reifers lock. While the court has found this to be incorrect, if it were correct, the success must then be related to molded cartons per se. But there are a number of patents, including the Cox '465 so highly touted in connection with the Patent Office proceedings, now in the public domain.[135]

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non-transferable license under the Reifers '094 patent to manufacture, use and sell in the United States 3 x 4 egg cartons, and cartons holding more than one dozen eggs, but which restricts the right to manufacture, use and sell 2 x 6 cartons to "*thirteen* Western States" (emphasis supplied), asserting that the 2 x 6 market was expanding. However, the licensing agreement (Px-144), contains a most-favored nation clause; and there is no contention that plaintiff's other licenses are restricted as to the manufacture, use and sale of 2 x 6 cartons.

[135] 1,690,492 Koppelman and Mapes
1,846,561 Koppelman
1,975,128 Sherman
1,970,145 Swift
2,061,064 DeReamer
2,061,065 DeReamer
2,093,280 Koppelman
2,423,756 Chaplin
2,466,579 Cox
2,517,465 Cox

Defendants in their Reply Brief, page 69, state that plaintiff has contended (and defendants apparently agree) that these were "paper patents", "still-born", "impractical" and "failures." It is hard for defendants so to contend, and stil deprecate the Reifers lock.

Plaintiff's Reply Brief to defendants' Main Brief on Validity, page 224, in a footnote states:

> "Subsequent to the conclusion of the trial, plaintiff has learned that Continental Can Company, a company with annual sales in excess of $1.3 billion is manufacturing and selling a carton like that shown in Cox 2,466,579 * * *"

This statement is not challenged by defendants in their reply brief.

In 1966, the last year for which figures are available, plaintiff sold 51.15 per cent of the egg cartons sold in the United States. This represents a decline from 1959 of 52.29 per cent and from 1960 of 52.23 per cent. The 1966 figure of 51.15 per cent involves an increase in the sale of molded pulp egg cartons by plaintiff, but at the expense of its sale of paperboard cartons.[136] The court finds that even if there were an attempt by plaintiff to monopolize the egg carton market, there is no dangerous likelihood of success.

The court finds as a fact, and concludes as a matter of law, that Reifers '094 is not unenforceable for violation by its owner of the antitrust laws.

Infringement

It is conceded that the flat top molded pulp egg cartons produced by PCA between June 27, 1961 (the date on which the Reifers '094 patent issued) and April 1963, when their production was discontinued, infringe Claim 1 of the Reifers '094 patent, if that patent is valid.

Thereafter PCA manufactured molded pulp egg cartons of the 3 x 4 and 2 x 6 type. Although these cartons appear to have "identity of means, operation and result" [137] with those set forth in the Reifers claims, defendants insist that certain physical differences in their cartons from the best mode set forth in the Reifers specifications avoid infringement.

These relate to the location in the accused devices of:

1. the apertures in the front wall of the cover, which do not extend up to the top panel of the cover;

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[136] Px-150.

[137] Scherbatskoy v. United States Steel Corporation, 7 Cir. 1961, 287 F.2d 552, 558.

2. the buttons or lugs, in their relationship to the tops of the eggs when the flap has been rotated upwardly and inwardly in the closing of the carton;

3. the top edge of the flange, which is below the tops of the accommodated eggs;

4. the buttons or lugs in front of certain eggs comprising the front row of eggs; and

5. the presence of a V-groove or rib in the cover, extending from front to rear.

Plaintiff to some extent questions the accuracy of the above factual assertions; and contends that these alleged variations are in fact covered by the claims in suit, either by specific language, or by the doctrine of equivalents. Although this combination patent is in a closely crowded art, and is not a pioneering breakthrough, it is of substantial importance in the field of egg cartons, constituting "a valuable contribution to the art," entitling the patent "to liberal treatment." [138]

Defendants' approach to the five factors mentioned above is the highly technical one that since the specification details one physically structured carton, and *arguments* in the File Wrapper emphasize certain physical features, the plaintiff is limited to the exact structure described in the specification, without regard to equivalence and despite the fact that the claims do not call for the specific structure. Indicative of this approach is the contention that the language: "The foregoing statements are indicative in a general way of the invention" [139] is limiting, or restrictive. Defendants emphasize that "not until

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[138] Hoeltke v. C. M. Kemp Mfg. Co., 4 Cir. 1936, 80 F.2d 912, 921; Denominational Envelope Company v. Duplex Envelope Co., Inc., 4 Cir. 1935, 80 F.2d 186, 187, 193. See also Graver Tank & Mfg. Co., Inc. v. Linde Air Products Co., 1950, 339 U.S. 605, 70 S.Ct. 854, 94 L.Ed. 1097.

[139] Column 3, lines 50-51.

the next paragraph in column 3 of the patent does Reifers refer to 'a single embodiment of the invention' "[140], and contend that all that precedes these quotations must therefore be the "only," and not the "best mode."[141]

The court concludes that the specification in Reifers '094 was intended to disclose an invention with respect to locking a molded pulp egg carton; and that the description of the particular carton was intended to show the best mode, and not the only, or exclusive, mode of carrying out the invention.

Claims "must be interpreted not literally in vacuo, but rather in the light of the specifications"[142], but "the specifications, unless so declared, are only an example of what the claim is intended to cover; it is a species of a broader genus, else no claims would cover anything not literally described in the specifications."[143]

Considering now the five structural elements relied upon by defendants to avoid infringement:

1. In the specification, the locking apertures are described as "adjacent" the top of the cover.[144] This results

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[140] Defendants' Reply Brief on the Issue of Infringement, page 4. See also Reifers '094, column 7, lines 63-68.

[141] Interestingly enough, PCA's present counsel, in the preparation of the specifications in Patent No. 3,184,133 to Boyd and Allen, assignors to PCA (Px-6-0) do not use the magic words "best mode"; and it is in the last paragraph of the specification that it is stated that "the present disclosure has been made only by way of example * * *" See also Patent No. 3,289,911 to Boyd and Thaldorf, assignors to PCA (Px-72 Column 6, lines 9-13.—Et tu Brute?)

[142] Wheeling Stamping Co. v. Standard Cap & Molding Co., 4 Cir. 1946, 155 F.2d 6, 8.

[143] Reiner v. I. Leon Co., Inc., 2 Cir. 1960, 285 F.2d 501, 504.

[144] Column 2, lines 31-33; 40-50.
Defendants' argument seems to be that this means "at" and

in maximum free movement between the lugs and eggs, and also is advantageous in molding and stripping.

Drawings for defendants' cartons beginning in 1963 initially called for holes below the top of the front wall of the cover, but these were changed, and cartons were manufactured in which the holes in the front wall of the cover extended to the very top. Later the holes were lowered to their present location, in which a substantial closed area extends between the top of the hole and the top of the front wall of the cover.[145] This admittedly was in an effort to avoid infringement[146] (presumably of Claim 2) and probably for this reason only, as the evidence is uncontradicted that from a manufacturing standpoint the hole extending to the top is preferable.[147] Visual observations of plaintiff's and defendants' product showed that the hole extending to the top presents a much neater appearance.

Apart from the questions of equivalence, and an inferior use of an invention, to be considered after dealing with defendants' five grounds of alleged distinction, the location of the locking apertures in defendants' cartons would still be an infringement of Claim 1, which is not limited to any particular relationship between the apertures and the top of the front wall of the cover. This is pointed up by Claim 2, reading:

> "2. A nestable molded pulp egg carton in accordance with claim 1, wherein the opening in the front side wall of said cover extends to the planar portion thereof and the latch on said latching flap is near the edge thereof which is remote from the hinge connection of the latching flap with the tray portion."

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not "adjacent." In the court's view, it is not necessary to decide what variance could be encompassed in "adjacent."

[145] Px-19A; Px-19B.

[146] Px-174, page 41.

[147] Transcript, 583, 584; 1435-36; 1564; 1640; 1768; 1934, 1935.

If Claim 1 covered the subject matter of Claim 2, Claim 2 of course would and could no thave been allowed.

2. As discussed under the first point, the specification recites an advantage of the suggested location of the apertures and lugs to be that by being in a zone "fartherest spaced from the maximum curvature of eggs in cells at either side thereof * * * there is a maximum free movement arm between each lug and adjacent egg, so that the lugs are disengaged with ease and convenience from the cover apertures in opening the carton." [148]

Defendants contend that in their cartons there is no substantial top space into which the flange may readily move for unlocking.

The accuracy of this statement is dependent in part upon the size of the contained eggs. With respect to pullet eggs, the statement is inaccurate; with respect to jumbos, the statement may be correct; [149] but the eggs may be so large as to prevent closing the carton, in which case, of course, there is no problem of opening. Clearly the mode described in the Reifer specifications is preferable to one which subjects the eggs to unnecessary pressure; but the Reifers claims are not limited to the precise structure described in the specifications and are sufficiently broad as to cover in this respect the accused cartons.

3. In support of contention 3 that Reifers '094 calls for the top edge of the flange to be above the tops of the accommodated eggs (which is an almost inevitable corollary of contention 2) defendants quote from Column 2,

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[148] Column 2, lines 32-39.

[149] Dx-11; Px-157.

The average size of eggs has increased since Reifers time, and what were then considered large eggs are now medium size eggs. Transcript, 1863-1864; Px-153, page 6. [No testimony was offered as to whether, and if so how far, Russian hen eggs surpass American hen eggs.]

lines 34-36 of the patent. Probably they also meant to refer to Column 6, lines 11-18, where reference is made to the flange being "in edge abutting, load sustaining relation to cover top panel * * * "

While of course testimony by an inventor in an infringement suit as to what his intentions were cannot be permitted to alter plain language, such testimony does show that while the preferred form would have the flange abutting the cover,[150] this was not essential to the true concept of the structure.[151]

Clearly an abutting flange would strength the carton, but there is nothing in either claim requiring this to be the case.

4. Defendants contend that the Reifers specification discloses a structure with the lug (or lugs) positioned between the front row egg cells, while in the accused cartons "the vertical planes of the lugs are aligned with the eggs, and threfore the eggs are subjected to the very crushing danger which Reifers says in substance must at all costs be avoided." [152]

Several comments are in order. In actual construction, the lugs in the accused cartons are *partially*, not directly, aligned with the eggs. Secondly, it is inconceivable that defendants would market, or want to market, a carton so constructed that the eggs are perpetually and deliberately subjected to crush-in danger (in packing, closing, shipping. and opening). Third, Reifers, does not take an "at all costs" approach, but points out that the preferred structure relieves the eggs of "wedging or crushing." [153]

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[150] Transcript, 1730.

[151] Transcript, 1781.

[152] Defendants' Reply Brief on the Issue of Infringement, page 7.

[153] Column 2, lines 10-14.

Defendants also point out that Reifers states [154] that the eggs have no function in respect to the making or maintenance of the interlock between the flange lugs and cover apertures; and that the lock is equally effective whether the carton is empty or wholly or partially filled.

Defendants' cartons lock satisfactorily when empty, or wholly or partially filled. No evidence was offered that the lock was not satisfactorily maintained when a carton was only partially filled.[155]

While of course not determinative, it is significant that PCA regarded the placement of the lugs between the cells and over the cells as equivalents. In Lambert application Serial No. 512,005 [156], in which a 3 x 4 carton is illustrated, the specification calls for a single button shown on the drawing to be centrally located (between cells 2 and 3) or two buttons (one over the part of cell 2 nearest to cell 1, and the other over the part of cell 2 nearest cell 4) as shown on the drawings.

The claims in said Lambert application refer to "at least one" locking member, and are silent as to where it or they are to be located with respect to the egg cells.

Further, in connection with possible infringement proceedings by Diamond against Molded Container Corporation and Herkimer, heretofore mentioned, the Molded Container Corporation 3 x 4 carton [157] had a two-button lock

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[154] Column 2, lines 6-14, 21-30.

[155] That is, with no eggs in the front row, or no eggs adjacent a lug or lugs. Either of these situations is likely to occur in use by a small family where only a few eggs are removed at a time. If the practice were to empty and discard the carton, staples would be an entirely satisfactory lock.

[156] Px-5; abandoned on the basis of Diamond's Shellmar Australian patent.

[157] Px-48A.

with the buttons located above the second and third cells of the front row of four cells. The Herkimer 3 x 4 carton [158] had a single button lock between the two center cells of the front row of four cells.

These two cartons were then— ante litem motam—considered by PCA's counsel as functioning in substantially the same manner, and that the Reifers '094 patent would read on the latching flap structures of each of the cartons.[159]

Moreover, the claims of the Reifers patent do not require the lug or lugs to be located in any particular relationship to the cells; although between the cells is obviously the better location.

5. Finally, defendants contend that the construction of their cartons with a V-groove or ridge in the cover, extending from front to rear, prevents infringement because of the language of Claim 1 calling for a carton with an "inverted dished cover, having a planar top, a front side, a rear side, and two ends, said front side being connected to said rear side only by said two ends and said planar top so that the front side is relatively flexible and is not rigidly tied to said rear side intermediate the ends of said front side * * * " [160]

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[158] Px-48B.

[159] Px-48.

[160] Column 8, lines 11-16.

Defendants also argue file wrapper estoppel. To the court it is clear that the arguments of counsel, and the decision of the Board of Appeals (Px-3, page 180) with respect to the cover related only to the non-cellular character of the top, as distinguished from the bottom of Koppelman '280. (Although the top and bottom of Koppelman were cellular, the Examiner had proposed an inversion of Koppelman). The insertion of the language in question was not required by the Examiner; he refused to allow claim 23 as amended and was reversed.

The court finds no element of file wrapper estoppel.

There are a number of considerations some of which, considered singly, and all jointly, require a conclusion adverse to defendants' position.

Of course an egg carton could not literally have a planar top and function as an egg carton. As the Court said in Methode Electronics, Inc. v. Elco Corporation, 3 Cir. 1967, 385 F.2d 138, 141, if the word "plane * * * were limited to its strict geometric sense * * * a plane in this sense has no depth and is only two dimensional." It is clear from the art, the file wrapper, and the patent itself [161] that the "planar top" was intended to be contrasted with a cellular top (such as Koppelman '280); and that the requirement that the front side be connected to the rear side only by the two ends was "*so that* the front side is *relatively flexible* and is *not rigidly tied* to said rear side intermediate the ends of said front side * * *." [162]

If the word "only" were given a literal construction, then any thickening between the front and rear sides—a band one millimeter wide and one millimeter thick—would avoid infringement. Obviously no court would so construe the word even if the "so that" explanation or qualification did not appear. With the "so that," it is unmistakeably clear that the purpose is to prevent connections between the front and rear sides which would so rigidly tie them that the front side would not be "relatively flexible."

Cox Patent No. 2,529,140 [163] illustrates a dished cover with a flat top, and the same top with a V-groove. In comparing the two, they are said to be the same as in the "non-divisible carton" except for the dividing groove.[164]

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[161] "Non-cellular". Column 1, line 21; Column 4, line 16; Column 6, line 50.

[162] Column 8, lines 12-16, emphasis supplied.

[163] Px-64.

[164] Column 6, lines 1-4.

Cox Patent No. 2,455,295 [165] discloses a similar V-groove. In the patent to Boyd and Allen, assignors to PCA, Patent No. 3,184,133 [166], illustrating an accused V-groove carton, it is stated: [167]

> "The cover 14 includes a *pair of coplanar* sections 40 and 42 which cooperate to form the top surface of the cover."

Boyd's testimony on deposition is striking. He admitted that obviously there was some flexing of the front wall of the carton when it was cammed over the buttons; and that the greater the distance the cover extended below the tie, the greater the flexibility. Because of this in the later accused devices of the defendants the distance below the V-groove has been increased, for greater flexibility.[168]

In another patent to Boyd and Thaldorf, assignors to PCA, Patent No. 3,289,911 [169] the carton 20 is described as comprising "an open top tray 21 having a cellular bottom 22." [170] The drawings and specifications call for a stiffening rib in the top. As to this, and the absense of necessity for it, the specification says: [171]

> "To provide added stiffness to the cover top surface 31, so as to resist warping or deforming of the cover when subject to a bearing load, an elongated rectilinear reinforcing rib 38 is formed therein which rigidly interconnects the back wall 34 and front wall

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[165] Px-40A.

[166] Px-6-O.

[167] Column 3, lines 26-28. Emphasis added.

[168] Compare the later cartons, Px-9A, Px-164, Px-170 with the earlier; Px-78, Px-170.

[169] Px-72.

[170] Column 2, lines 71-72.

[171] Column 3, lines 27-40.

> 32. The rib is centrally disposed between cover end walls 33 and 35 and depends from top surface 31 an amount less than the extent to which the walls depend therefrom. Other ways of providing added stiffness for the cover may be utilized, if desired, or *in some instances the rib or other stiffening means may be eliminated completely.* The rib or stiffening means per se forms no part of the instant invention." (Emphasis supplied).

Whether the purpose of the rib is to add strength, or to try to avoid infringement is not clear. As will shortly be discussed, even if it is an improvement, that may well be the basis for a patent on the improvement, but would not necessarily avoid infringement if the patentable features of Reifers '094 are used without a license.

There is real question as to whether the V-groove does add strength to the carton.[172]

After May 13, 1963, PCA discontinued the manufacture of the flat top carton and began the manufacture of a 3 x 4 V-grooved carton.[173] However, at least as late as March 1964 issue of "Poultry Processing and Marketing" magazine[174] PCA was still advertising the flat top carton as providing the "finest protection," but was filling orders with the V-groove carton.[175] This is either an unequivocal admission of equivalency, or unscrupulous dealing with customers.[176]

In the accused cartons the front side is not so rigidly tied to the rear side as to keep the front side from being relatively flexible. The V-groove or rib does not avoid infringement.

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[172] Transcript 26; Allen deposition, Px-177, page 16.

[173] Pretrial Order, paragraph 7.

[174] Px-160.

[175] Transcript, 2208-2209.

[176] PCA has not stated which interpretation it prefers the court to take.

The five purported differences alleged by defendants between the accused devices and what they wish to read into the claims may represent, in the case of the V-groove, an improvement, or with respect to the size of the flange and the location of the latching lugs, a less satisfactory or inferior structure. The accused devices [177] are of a construction substantially the same as that claimed in Reifers '094; operate in substantially the same way; and produce substantially the same results. Therefore there is infringement. Supplementation or modification, even if an improvement will not avoid infringement; nor will an impairment. Ransburg Electro-Coating Corp. v. Proctor Electric Co., D.Md.1962, 203 F.Supp. 235, 258, and cases cited therein, aff'd 4 Cir. 1963, 317 F.2d 302; Marston v. J. C. Penney Co., Inc., 4 Cir. 1965, 353 F.2d 976; Matthews v. Allen, 4 Cir. 1950, 182 F.2d 824, 827-828.

Plaintiff has charged that the infringement has been wilful, and asks for appropriate penalties. While the validity of the Reifers '094 patent, and the infringement thereof, appear to the court to be clear, the court is not prepared to say that defendants may not in good faith have believed that the structural changes they initiated to avoid infringement were probably sufficient. The court is therefore unwilling to find that the infringement was wilful.

Reifers Patent 2,990,094 is valid, infringed, and may be enforced against the defendants.

The defendants' counterclaims are dismissed.

The foregoing opinion embodies the court's findings of fact and conclusions of law under Rule 52, F.R.Civ.P.

The parties are hereby directed to submit an appropriate decree. They are also to endeavor to agree upon an accounting.

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[177] The court has not dealt with the announced cartons. They have not been put on the market and the court will not give advisory opinions.

APPENDIX E

Paper No. 20

[Mailed Feb. 1, 1961, U. S. Patent Office Board of Appeals]

Appeal No. 369-84

Hearing: January 23, 1961

IN THE UNITED STATES PATENT OFFICE

BEFORE THE BOARD OF APPEALS

Ex Parte Richard F. Reifers

Application for Patent filed April 19, 1957, Serial No. 654,016, a Continuation-in-Part of Application Serial No. 398,475, filed December 16, 1953, now abandoned and application Serial No. 289,727, filed May 24, 1952, now abandoned. Molded Pulp Egg Carton.

Karl W. Flocks for appellant.

Before Dracopoulos, Bailey and Freehof, Examiners-in-Chief.

Freehof, Examiner-in-Chief

This is an appeal involving a consideration of claim 23 which was submitted for finally rejected claims 19 through 22. Claim 24 has been allowed.

Claim 23 reads as follows:

23. (a) In an integral and nestable egg carton made of relatively flexible molded pulp,

(b) a cellular tray portion having a front side, a rear side, and two ends,

(c) an inverted dished cover hinged to said tray portion,

(d) means for latching said tray portion (when loaded with eggs) to said cover with a latch located above said tray portion and extending completely through said cover from the inside to the outside (without disturbing the eggs), said latching means comprising the following structural characteristics:

(e) said tray portion having its front side strongly tied to its rear side by a plurality of spaced cell-forming partitions extending generally parallel to said tray portion ends, said partitions acting as means for preventing spreading of said front side from said rear side, said tray portion including egg cells adjacent but below the latching means which cells have imperforate walls,

(f) said inverted dished cover having a planar top, a front side, a rear side, and two ends, said front side being connected to said rear side only by said two ends and said planar top so that the front side is relatively flexible and is not rigidly tied to said rear side intermediate the ends of said front side, said front side of said cover having an opening formed therein through which the latch is adapted to extend completely from the inside to the outside.

(g) said dished cover being hinged to said tray portion along its rear side,

(h) a latch holding flap hinged to the front side of said tray portion,

(i) the hinge line connection of said cover with said tray portion and the hinge line connection of said latching flap with said tray portion being maintained parallel by said

tying partitions even when the tray portion is loaded with eggs,

(j) said latch on said latching flap (when said carton is open) being located on one side of said tray portion which is opposite to the side where the cover is connected to the tray portion so that both the cover and the latching flap are each connected to the tray portion when the carton is open,

(k) said molded pulp egg carton being integrally formed with the latching flap, the upper edges of the two sides and two ends of the tray portion, the upper edges of the two sides and two ends of the cover generally in the same plane and with the latching extending downwardly from the underside of the latching flap which is hinged to the front side of the tray portion and said latch being relatively close to the tray portion as compared with the opening in the front side of the cover which is relatively remote from the tray portion.

(l) when the tray portion is loaded with eggs and the latching flap is turned upwardly and the cover portion is rotated in a direction to telescope over the latching flap, the two hinge lines are relatively immovable but the front side of the cover may flex whereby the loaded egg carton may be latched by simply rotating the latching flap upwardly and inwardly and rotating the cover upwardly and around the latching flap while the structural features maintain the geometric relation of the latch on the latching flap to the opening in the cover until the front side of the cover engages the latch on the latching flap and is cammed thereover until the latch on the latching flap registers with the opening in the front side of the cover whereupon the latch passes through the opening in the cover from the inside to the outside to effectively latch the carton without disturbing the eggs.

The references relied upon by the examiner are:

Koppelman	2,093,280	Sept. 14, 1937
Schilling	2,600,130	June 10, 1952
Cox	2,771,233	Nov. 20, 1956

The subject matter claimed relates to a molded pulp egg carton comprising a cellular tray portion, a cover hinged to the tray portion and means for latching the tray portion, to the cover. The tray and cover portions are of the type shown in the Cox patent. The improvement over Cox is stated to be in the manner in which the cover is latched to the tray. Further details are described by appellant in his brief to which reference is made.

Claim 23 was considered to be unpatentable over Koppelman in view of Cox and Schilling or over Cox in view of Koppelman and Schilling. The references are described in the brief. The examiner held that "It was considered to be obvious that Koppelman's device might be used in the reversed position, with the latching flange extending upwardly, if desired, without invention." He stated that the claim so considered distinguishes over Koppelman in the particular cellular structure of the tray and cover formation. Such structure, however, being old in Cox and Schilling, the examiner held that it was not patentable to form the Koppelman tray and cover in a similar manner. The examiner also stated that to provide latch means in Cox of the type shown in Koppelman was not a patentable matter. The examiner's position is more fully stated in his answer.

Appellant urges that the prior art cited by the examiner, as well as other references in the art, do not disclose or suggest a carton having the relationship of the elements as claimed. Appellant also urges that his carton has advantages which are not attained in any of the prior art cartons.

After due consideration of the position taken by the examiner and the arguments presented by appellant in his brief and at the hearing, we are constrained to disagree with

the position taken by the examiner in holding claim 23 to be unpatentable over the prior art.

The patent to Cox does not show a latch of the character claimed. In this patent staples or glue are relied upon to hold the cover in closed position. In the patent to Schilling the tray portion 10 and the cover portion 34 correspond to appellant's tray and cover. Schilling, however, uses an inverted tray portion 12 whereas appellant utilizes a flap hinged to the front side of the tray. The sections 12 and 14 are provided with projections 38′ and 38 which frictionally hold the cover section 14 in closed position. These sections, however, do not correspond to the opening in the cover and the latch portion in the flap as set forth in the claims.

Appellant urges that it is impossible for Schilling to mold a latch in his "Tri-fold" carton. He states that if buttons would be molded on the cover 12 in Schilling, they would present undercuts so that the carton could not be removed from the mold and the cartons could not be nested.

While Koppelman shows a pocketed tray portion, he does not show an inverted dished cover portion of the character claimed. To utilize Koppelman's carton in an inverted position would be contrary to the teachings of Koppelman since in Koppelman his locking device takes advantage of the weight of the eggs and their pressure against the wall of the carton. It is urged that the partial or limited cell structure can not tie the front of the tray to the back of the tray and obtain the desired parallelism between the front and the rear hinged lines. The formation of the latch receiving opening in the lower tray in Koppelman would provide for leakage in the event an egg broke.

In appellant's construction the tray is imperforate. The partition structure ties the front side of the carton to the rear side of the carton to maintain parallelism between the latching flange hinge and cover hinge and such parallelism is highly desirable for automatic closing operation. Auto-

matic closing equipment can operate from both sides of the carton to effect closing and latching without disturbing the eggs.

In view of the state of the prior art, it is not apparent that without the knowledge of appellant's disclosure, it would be obvious to one having ordinary skill in the art to provide a carton of the character claimed. The advantages of appellant's carton embodies in a novel structure are deemed to be sufficiently significant to warrant allowance of the claim. The rejection will not be sustained.

The decision of the examiner is reversed.

REVERSED

/s/ P. L. Dracopoulos
Examiner-in-Chief

/s/ M. A. Bailey
Examiner-in-Chief

/s/ H. B. Freehof
Examiner-in-Chief

Board of Appeals

Karl W. Flocks
Munsey Building
Washington 4, D. C.

APPENDIX F

28 USC 1254. *Courts of appeals; certiorari; appeal; certified questions*

"Cases in the courts of appeals may be reviewed by the Supreme Court by the following methods:

(1) By writ of certiorari granted upon the petition of any party to any civil or criminal case, before or after rendition of judgment or decree; . . ."

§ 1338. *Patents, copyrights, trade-marks and unfair competition*

(a) The district courts shall have original jurisdiction of any civil action arising under any Act of Congress relating to patents, copyrights and trade-marks. Such jurisdiction shall be exclusive of the courts of the states in patent and copyright cases.

28 USC 1400. *Patents and Copyrights*

"(b) Any civil action for patent infringement may be brought in the judicial district where the defendant resides, or where the defendant has committed acts of infringement and has a regular and established place of business."

35 USC 101. *Inventions patentable*

"Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title."

35 USC 102. *Conditions for patentability; novelty and loss of right to patent*

"A person shall be entitled to a patent unless

(a) the invention was known or used by others in this country, or patented or described in a printed publication

in this or a foreign country, before the invention thereof by the applicant for patent, or

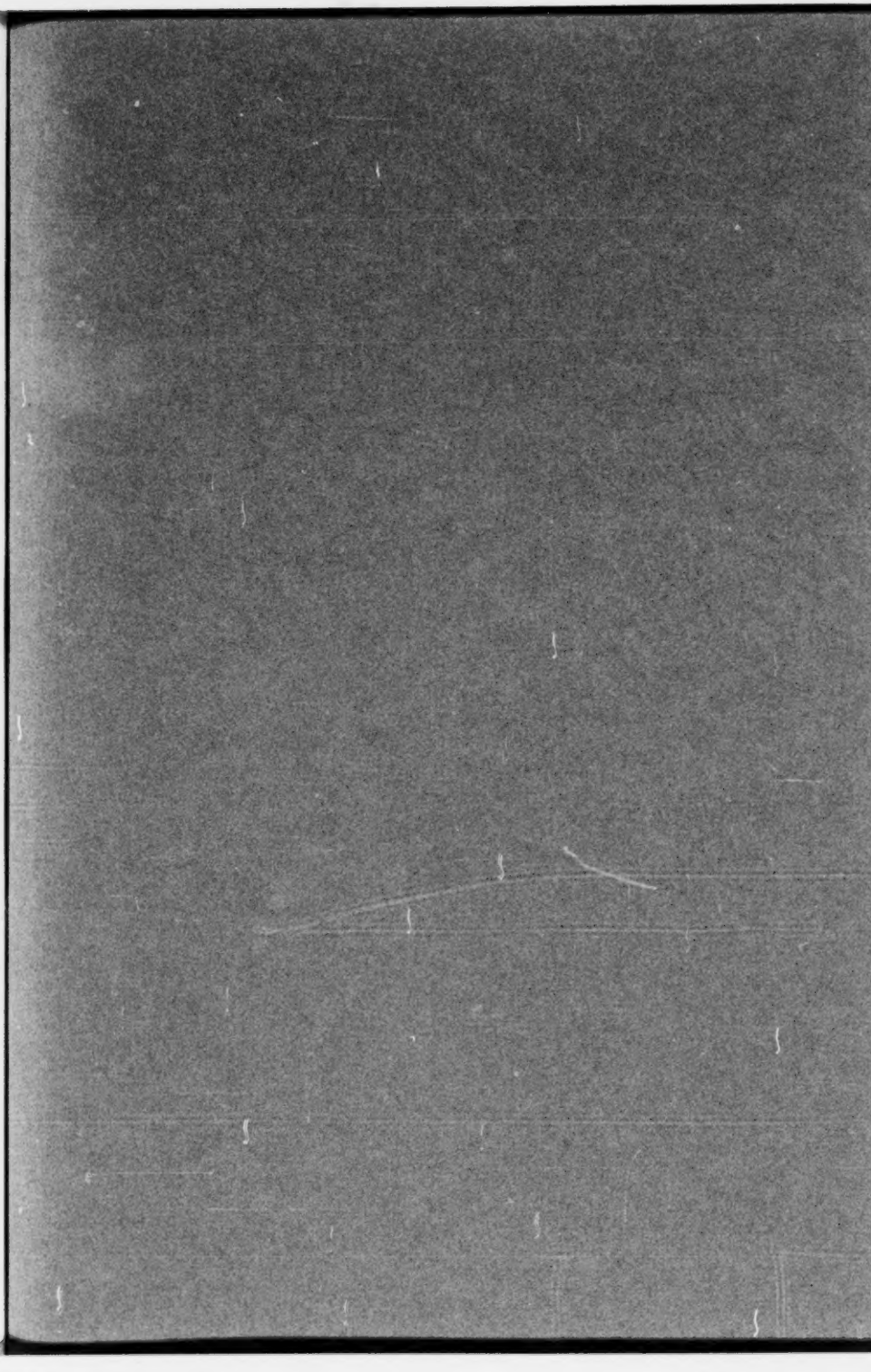
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States, or

* * *

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, . . ."

35 USC 103. *Conditions for patentability; non-obvious subject matter*

"A patent may not be obtained through the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made."



MICHAEL

IN THE

Supreme Court of the United States

OCTOBER TERM 1975

No. 75-885

DIAMOND INTERNATIONAL CORPORATION, *Petitioner*,

v.

MARYLAND FRESH EGGS, INC., *Respondent*.

PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FOURTH CIRCUIT

SUPPLEMENTAL APPENDICES "G"-"Q"
[Patent Copies and Photos]

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June 27, 1961 R. F. REIFERS 2,990,094

MOLDED PULP EGG CARTON (Appendix B)

Original Filed Dec. 16, 1953 2 Sheets-Sheet 1

Fig. 1

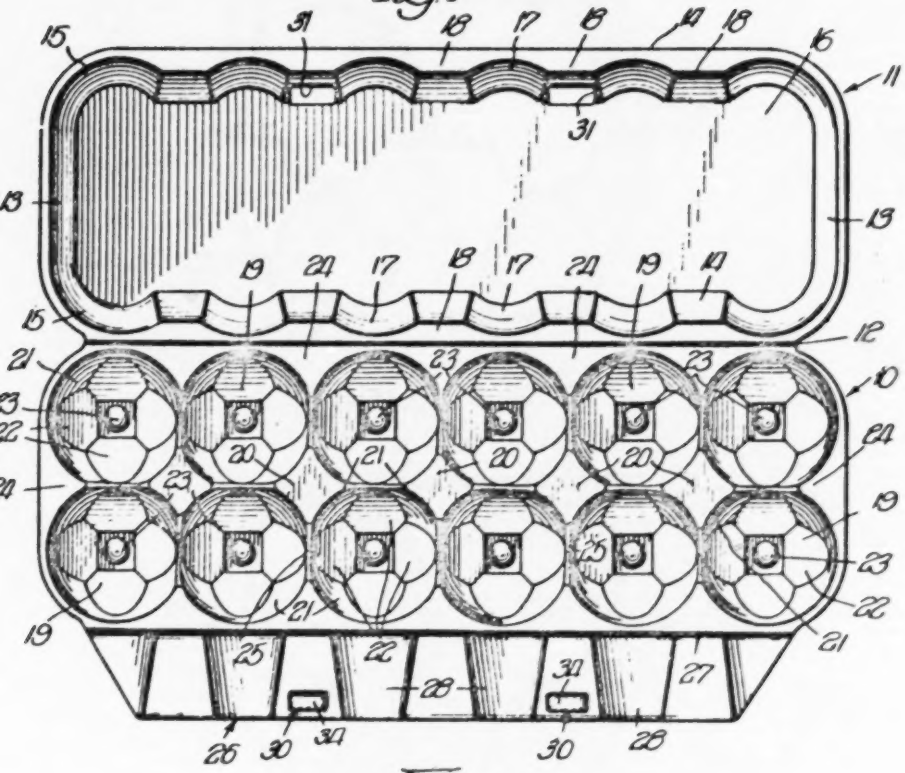


Fig. 2

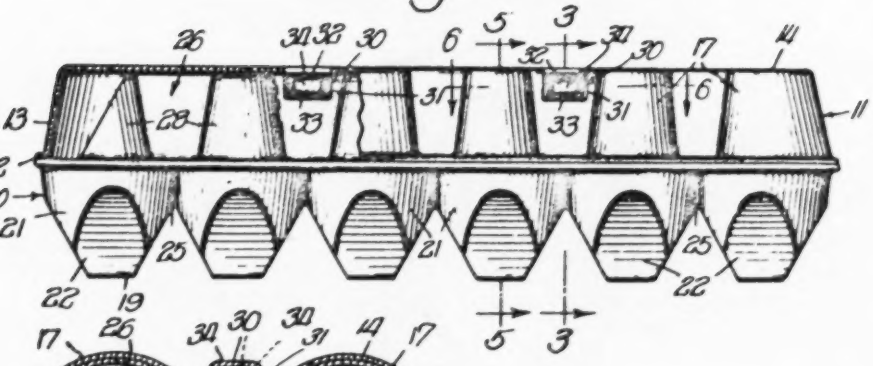
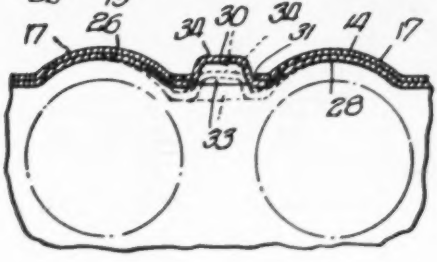


Fig. 6



Inventor
Richard R. Reifers

By Karl W. Flocks
Attorney

June 27, 1961 R. F. REIFERS 2,990,094

MOLDED PULP EGG CARTON

Original Filed Dec. 16, 1953 2 Sheets-Sheet 2

Fig. 3

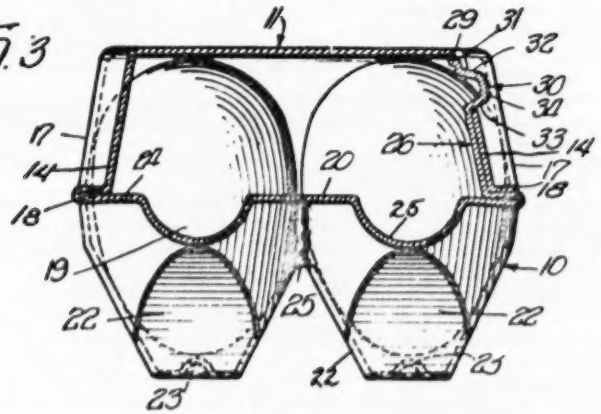


Fig. 4

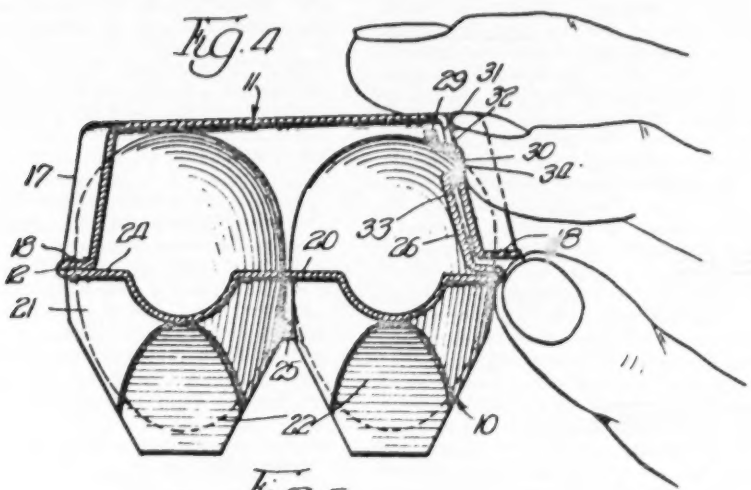
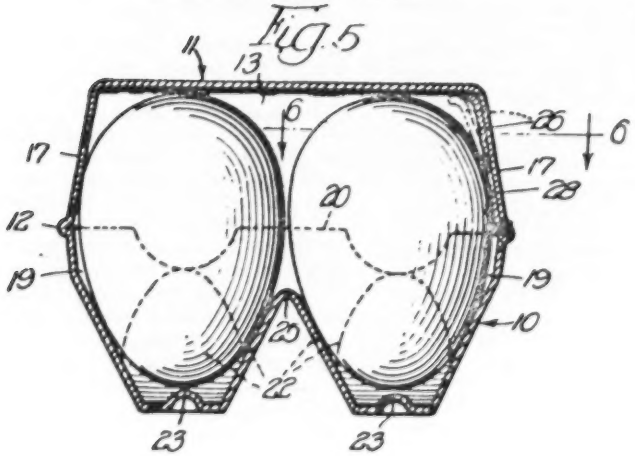


Fig. 5



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United States Patent Office

2,990,094
Patented June 27, 1961

2,990,094

MOLDED PULP EGG CARTON

Richard F. Reifers, Lincolnwood, Ill., assignor to Diamond National Corporation, a corporation of Delaware

Continuation of abandoned application Ser. No. 398,475, Dec. 16, 1953. This application Apr. 19, 1957, Ser. No. 654,016

2 Claims. (Cl. 229—2.5)

The present invention pertains to improvements in a molded pulp egg carton and particularly to its integral means to releasably lock together the cover and bottom sections of the carton. This application is a continuation of my copending application Serial No. 398,475, filed December 16, 1953, now abandoned, which, in turn, is a continuation-in-part of my application Serial No. 289,727, filed May 24, 1952, now abandoned.

Locking provisions which are integrally built into the improved carton securely but releasably hold its cellular, egg receiving bottom section and its non-cellular, flat-topped, tray-like cover section in closed condition; and one of the main advantages of the improvement is that a very reliable locking action is had while still holding the longitudinal and transverse dimensions of the sections sufficiently small that 30 of the filled and closed cartons of the 2x6 style can be packed in a standard 30 dozen egg case.. The locking provisions occasion no increase in the over-all dimensions of the carton.

A filled carton can be closed and locked without damaging its complement of eggs by simple automatic machinery operating at high speed; the strength of its integral lock far exceeds that afforded by any egg carton locking device now or previously on the market; and the carton is internally braced and rigidified by an integral, cell defining partition structure, whose rigidifying effect contributes materially to the efficacy and strength of the lock. Yet the locking provisions are conveniently accessible from the top and exterior of the carton for quick and easy unlocking, again without imposing crushing stress on the eggs. The locking elements have been devised with as much attention to their release as to their initial engagement.

Specifically, the invention provides a molded pulp egg carton featuring an internal cover bracing and locking flange which is integrally carried on a side margin of its cellular bottom section. The flange telescopes slidingly upwardly in the cover section of the carton as the cover is brought down toward the bottom section, finally assuming face to face engagement with a front wall of the cover. Externally projecting locking lugs are integrally molded in the flange, and the cover wall faced thereby has locking apertures molded therein to receive the locking elements under an inherent outward spring of the flange about its integral connection to the bottom.

A very rigid quality is imparted to the bottom section, notwithstanding the egg cushioning ability of its individual cells, by its integrally molded internal partitioning structure, which ties the section together as a rigid box-like unit. This structure stabilizes and stiffens an integral longitudinal hinge which connects the flange to the bottom section, with the result that a spring action of the flange about that hinge is made very pronounced. There is a stressing of the pulp fibers at the hinge as the flange is swung inwardly to upright condition which insures snap engagement of the flange locking lugs in the cover apertures when the flange is fully telescoped.

The locking apertures are so located in relation to a top panel of the cover, being closely adjacent the same, and the shapes of the locking flange and its lugs are such, as

to secure optimum efficiency in engaging and also in disengaging the lock.

The eggs are shielded by the upstanding bracing and locking flange as the carton sections engage and disengage, with the carton cover sliding over the outer face of the flange. The eggs have no function whatsoever in respect to the making or maintenance of the interlock between the flange lugs and cover apertures; hence, the lock is equally effective whether the carton is wholly or partially filled, or even when it is empty. It follows that the eggs are not subject to any wedging or crushing as the cover is closed over the flange and bottom, which would of course be extremely objectionable in a carton intended to be closed and locked by machinery.

In regard to the matter of disengaging or releasing the lock, the shape of the upstanding bracing and locking flange permits it to have side engagement with eggs in cells adjacent its hinge only at a zone slightly above their zone of maximum girth. This is true for even the largest size of eggs, or "jumbos," which can be housed in the carton. A substantial top space is left at the centers of the egg cells and between the flange and the upwardly receding curvatures of eggs in those cells, into which the flange can flex inwardly a substantial distance as its locking lugs are depressed to release the same. It is primarily the inherent hinged spring of the flange, not its abutment against the eggs in the cells, which resists release of the lugs; since there is no appreciable contact of the flange with the eggs at the vertical planes of the lugs themselves, which are between egg cells.

Inasmuch as the locking lugs are positioned adjacent the top of the flange, for reception in apertures adjacent the top of the cover, they are in a zone farthest spaced from the maximum curvatures of eggs in cells at either side thereof. It follows that there is a maximum free moment arm between each lug and adjacent egg, so that the lugs are disengaged with ease and convenience from the cover apertures in opening the carton.

The location of the locking apertures also bears on the procedure of molding the cartons. Being high in a front wall of a cover, i.e., adjacent its junction with the cover top panel, also assures that the molded carton will strip freely from a molding die. Since a plug in the molding screen is employed to form each aperture, the location of the latter at an intermediate point, heightwise of the flange, would cause the plug to interlock with the molded pulp fibers and prevent stripping. As constructed, the plug strips freely past the margin of the cover panel at the aperture.

Inasmuch as a strong snap action of the flange locking lugs, in springing into the apertures of the cover section wall, has been coupled in the improved carton with an adaptability of those lugs to be readily unlocked manually by the user, the invention furthers the attainment of this end by means of an improvement in the shaping of the lugs. They are contoured in the molding operation so that their lower surfaces merge downwardly at an appreciable angle to the horizontal into the remainder of the flange. This enables the lugs to cam themselves up over the lower surface of the cover wall aperture as they snap outwardly into the aperture. The effect, though slight, is that of urging the wall downwardly toward a closed position of the cover. Merging at a downward angle into the flange, the lugs will not be embedded by the bottom margin of the wall aperture, hence are freely depressed inwardly for unlocking.

The upper surface of each lug also angles, in this case upwardly, to a merger with the flange immediately adjacent its top, free edge. This assists the cover in sliding downwardly and over the lugs as the cover is plowed into closed position by the closing machine. In sliding

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SUPPLEMENTAL APPENDICES "G" - "Q"

[Patent Copies and Photos]

over the upper inclined surfaces of the lugs, the apertured free cover wall flexes outwardly, so that interference with the remainder of the free edge of the flange, as the cover continues its downward movement, is impossible.

The flexibility of the apertured and externally telescoped cover wall of course diminishes from a maximum at its free lower edge to a minimum adjacent its merger with the top. In offering maximum resistance to outward flexure at its topmost point, the wall resists to the greatest degree inadvertent displacement of a flange locking lug from its aperture as a result of accidental outward wall flexure. The stabilizing action of the braced bottom section on the flange hinge is also a contributing factor in this matter, since a laterally unrestrained hinge would compound the likelihood of an accidental unlocking of the lug upon flexure of the cover wall.

Another aspect of the bracing of the cellular bottom section by its integrally molded, upstanding longitudinal partition and cross partition structure is that this structure, as herein proposed, makes possible the over-all compactness of dimension of the improved carton. The bottom section is subdivided into rows of cells by continuous, longitudinally extending and integrally connected dividers, whose tops represent the approximate height of the cells. The dividers incline downwardly from the tops to intermediate zones at which successive cells are merged with one another by upwardly tapering lower wall portions. These portions are of substantially polygonal outline and joint upwardly into generally conical upper cell portions which are at a lesser angle to the vertical.

Successive cells are thus merged with one another at intermediate zones, in reference to the horizontal dimensions of the cells, and at an intermediate elevation which is approximately midway of the height of the cells. Each carton cell thus provides the necessary egg supporting cushion, at its upwardly tapered lower portion, for the smaller end of eggs disposed therein, and the eggs are laterally and longitudinally restrained and separated by the upper portions at the approximate maximum egg girth; yet the eggs are brought as close together as possible without actual contacts.

All of these factors compact the closed carton so that it can be packed in a standard 30 dozen egg case, and still the design of the locking flange in relation to the non-cellular carton cover permits the flange and its locking lugs to freely flex inwardly in locking and unlocking, without in either case imposing any crushing stress on even the largest sizes of eggs which can be placed in a row of cells adjacent the flange.

The foregoing statements are indicative in a general way of the nature of the invention. Other and more specific objects will be apparent to those skilled in the art upon a full understanding of the construction and operation of the improved carton and its locking features.

A single embodiment of the invention is presented herein for purpose of illustration. However, the invention may be incorporated in other modified forms coming equally within the scope of the appended claims.

In the drawings:

FIG. 1 is a top plan view of a finished molded pulp carton in the open, generally planar condition thereof as stripped from molding and drying dies, showing the highly compact nature of the carton;

FIG. 2 is a view in front elevation of the improved carton in closed and locked condition, being partially broken away to more clearly illustrate the character and action of the automatic internal locking flange and lugs thereof;

FIG. 3 is a view in transverse vertical section of the closed and locked carton along a line corresponding to line 3—3 of FIG. 2, which is in the vertical plane of a locked flange lug and cover aperture, showing the final relationship of the locking lug and aperture to one another and indicating the relationship of these features to a large size egg just behind them;

FIG. 4 is a view in transverse vertical section similar to FIG. 3, showing the simple manner of manipulating the carton to disengage the flange locking lugs;

FIG. 5 is a view in transverse vertical section along line 5—5 of FIG. 2, i.e., in a vertical plane through egg cell centers, illustrating the top clearance which the improved carton affords at this occupied zone for inward flexure of its bracing and locking flange; and

FIG. 6 is a fragmentary view in horizontal section along line 6—6 of FIGS. 2 and 5, showing in solid and dotted line how the carton permits inward flange flexure in disengaging its lock.

The illustrated carton, shown in FIG. 1 in its flat condition as stripped from a drying form, comprises a cellular, pronouncedly compartmented bottom section, generally designated 10, to which a non-cellular or open faced, tray-like cover section 11 is integrally hinged by a longitudinal crease 12 at corresponding side margins of the sections. Cover section 11 has pairs of opposed end walls 13 and side walls 14 integrally joined by rounded corners 15, and a flat top panel 16 is likewise integrally joined about its periphery with the walls. The exterior surface of this panel is smooth and continuous, well suited for the reception of printed matter or ornamentation.

Cover section side walls 14 are of scalloped shape, featuring longitudinally spaced, outwardly curved or recessed bays 17 formed by frusto-conical sectional surfaces molded in the front wall 14 of the cover section to increase the egg room in the cover section above the egg cells of the bottom section, which recesses are spaced by intervening, inwardly extending abutment portions 18. These have stable vertical engagement with cellular bottom section 10 when the carton is closed.

The interior of bottom section 10 is partially subdivided into two rows of six egg receiving cells 19, in the type of carton chosen for illustration, by a longitudinally extending series of upstanding center separator posts 20 which are of generally rectangular outline at their tops. Their sides merge downwardly in a concave shape, as at 21, and at an angle to the vertical, into flat lower cell walls 22 which are arranged in rectangular outline. The floor of each cell 19 has a convexly rounded cushion button 23 molded therein which will afford a yieldable support for a relatively small egg. However, the primary cushioned vertical support is at the flat divergent wall surfaces 22. Spaced, inwardly extending side and end abutment webs 24 along the respective side and end walls 13, 14 of bottom section 10 complete the cellular partition structure of the latter. They have generally conical, upper and flat, lower cell defining surfaces which merge beneath the cell tops in like manner to the surfaces 21, 22 of central posts 20. The cells 19 are contiguous in their longitudinal and transverse arrangements. That is, the intended spacing of the bottoms of successive cells brings them so close to one another that adjacent, upwardly tapering flat surfaces 22 meet well below the top of the cells, in fact at an elevation a little more than midway of the cell height, as appears in FIG. 3. This is true of any pair of successive cells whether arranged transversely of the carton or in one of its longitudinal rows.

The merger of successive contiguous cells occurs approximately at, and not below, the elevation at which the respective sets of lower flat surfaces 22 merge upwardly into the conical surfaces 21. The result is that downwardly curved intermediate ridges or saddle-shaped portions 25 integrally connect successive posts 20 with one another, in the longitudinal direction, and integrally connect each post with abutment ledges 24 on either side thereof, in the transverse direction. These depressed connections are of slight width, their cross section representing a somewhat thickened apex of the upwardly convergent surfaces 22, and they are concavely curved in their transverse contour. Thus eggs in successive cells are brought as close together as possible, for the larger

sizes, yet they are safely protected against contact by the upwardly tapered cell dividers 25 and posts 20. The conical upper surfaces 21 of the posts 20 and side and end abutments 24 cradle the maximum girth of the eggs, restraining them from contact and holding them from rolling when the carton is open.

In practice it has been found best to taper the lowermost flat cell surfaces 22 at an angle of about 28° to the vertical, with the upper conical surfaces at a substantially lesser angle, as shown in FIG. 5. This gives best cushioned egg support at surfaces 22 and best horizontal egg restraint at its zone of approximately maximum girth.

Thus, the improved carton presents a cellular bottom section 10 made up of cells which are contiguous well beneath the tops and above the bottoms thereof. This means the maximum compacting of the over-all longitudinal and transverse dimensions of the carton as a whole, which will enable the cells to accommodate large size eggs without their destructive contact with one another and to hold the eggs against excessive tilt or shift. The partitioning means extend integrally from end to end and side to side of the carton, substantially rigidifying the same as a result.

An elongated internal cover bracing and locking flap or flange 26 is integrally hinged by a longitudinally extending crease 27 to the side margin of bottom section 10 opposite its cover hinge 12. Flange 26, like the side walls of cover section 11, is of generally scalloped outline. It has egg accommodating bays or recesses 28 formed by frusto-conical sectional surfaces molded therein which are in transverse alignment with the bottom section egg cells 19 and intervening, inwardly projecting abutments 29 which are transversely aligned with the side abutments 24 of the bottom. Flange 26 and the front or free unhinged wall of the cover 11 carry the locking provisions of the carton.

The locking means comprises a pair of locking elements or lugs 30 which are integrally molded in the flange 26 to project outwardly adjacent the free outer edge thereof, and detent apertures 31 molded in the front wall 14 immediately adjacent its junction with cover top panel 16. The lugs and apertures are of substantial width in order to take strong and tear resistant engagement when the carton is locked. The lugs are characterized by upper and lower surfaces 32, 33, respectively which angle divergently and merge with the remainder of flange 26 above and below the lugs. A rounded nose 34 connects lug surfaces 32, 33.

The locking apertures 31 extend upwardly from an intermediate point in the height of cover front wall 14 to its junction with the top panel 16 of the cover section, as illustrated in FIGS. 2, 3 and 4. Locking and bracing flange 26 is of a height to also extend to this panel, being in edge abutting and vertically bracing engagement with the latter, as well as in internal, side by side contact with the inner surface of the apertured cover front wall when the carton is closed and locked, as in FIG. 3. However, it should be noted that in this condition the flange is readily flexible inwardly to disengage the lock as an inspection of FIGS. 5 and 6 will reveal and as will be hereinafter explained in detail. FIG. 6, which depicts in dot-dash line the shape or outline of eggs at the elevation at which the section is taken, shows the substantial space between the eggs and the flange which permits freedom of inward flange flexure.

In using the carton eggs are deposited, large end up, in bottom section cells 19, whereupon flange 26 is swung to upstanding position adjacent the front row of eggs and the cover section 11 is swung downwardly into externally telescoped relation over the flange. These operations are ideally performed on high speed closing apparatus adapted to plow the flange and cover inwardly about their hinges and swing the cover down. As this happens, the free front cover wall 14 slides downwardly over the upper inclined camming surface 32 of the flange locking lugs 30, flexing the wall outwardly so that it is unnecessary to exert special precautions to cause the cover to clear the flange. When the lower edge of each wall aperture 31 passes the nose 34 of its locking lug the latter snaps outwardly under the inherent spring of flange 26 to a positively interlocked relationship in the aperture. The lower inclined surface 33 of the lug facilitates its entry into the aperture without snagging, and the inclination even exerts some cam action on the cover wall to urge it further down as the wall returns inwardly.

Flange 26 is in edge abutting, load sustaining relation to cover top panel 16 when the cover is fully closed, and its inherent outward spring urges it outwardly to maintain this strut relationship to the cover and to resist accidental inward displacement of lugs 30 from apertures 31. The lock has been completed without the necessity of jamming flange 26 inwardly under substantial force which would be apt to crush the eggs.

In order to unlock the cover, lugs 30 are pressed inwardly in the fashion illustrated in FIG. 4, preferably placing the thumbs beneath locked cover section wall 14 and the index fingers in engagement with the lugs, with the other fingers of the hands resting on top panel 16 as a fulcrum for an outward stretching of wall 14 and upward lift of wall 14 as the lugs 30 are depressed inwardly. Inward springing of flange 26 which necessarily attends the depression of the lugs is facilitated due to the arrangement of the latter in a top portion of the flange, immediately adjacent its free upper edge. See FIGS. 5 and 6.

By reference to FIGS. 5 and 6, it is seen that there is a substantial space between the upper part of the flange and the receding upper curvature of an egg to permit ready inward flexure of the flange. The most restricted space is at the longitudinal center of an egg cell, a zone depicted in FIG. 5, and it is there indicated in dotted line how the flange 26 can flex inwardly at its top to accommodate inward shift of its lug in a zone to one side of the egg. The egg will not ordinarily be engaged by the flange at an elevation even as much as midway of the height of the cover section 11. There is a maximum moment arm between the lug 30 and this point of egg-flange engagement for inward yielding of the flange and unlocking of the carton.

There is no possibility of damaging an egg in unlocking. The lugs are conveniently accessible to the fingers with the carton in upright position, and when the cover is opened the eggs are held in place against roll or shift by their individual, relatively high walled cells.

The non-cellular cover section 11 will of course permit some degree of rearward tilt of large sized eggs, if necessary, in flexing flange 26 between egg cells to close or open the carton, so that in no case do the eggs themselves act as an abutment primarily holding lugs 30 in apertures 31. This will inevitably cause egg breakage. It is the spring of the flange at its stiffly stabilized hinge, coupled with its top flexibility, which are the key to the maintenance of the lock and to its ready disengagement when desired. The partitions which compartmentize bottom section 10 tie its two longitudinal hinge-bearing walls together in a rigid relationship.

In short, as regards flexibility, the bottom section 10 progresses upwardly from a practically inflexible perimeter, rendered so by its elevated, internally molded partitioning in integral merger with its walls, past the flange hinge and into the locking flange 26. The latter decreases in its resistance to local flexure from maximum at a lower portion adjoining the hinge, which determines the flexibility or snap of the flange as a whole, to an upper free edge which is of maximum local flexibility, as about any upright fulcrum.

The reverse is true in reference to the outer free wall 14 of cover section 11. Its yieldability to outward flexure increases from a zero or minimum at its junction with top panel 16 to a maximum at its lower free edge. This

means that since locking apertures 31 are located at a zone of minimum flexibility they will have best locking stability in holding lugs 30; the lower part of the wall can still flex outwardly for ease of camming engagement of the lock lugs, and for disengaging them manually, when desired.

Locking lugs 30 can be made wide and rugged, for example of a width substantially exceeding that of the intermediate transverse space in the cover 11 to permit their rearward flexure.

The carton is capable of repeated re-use without noticeable diminution of the effectiveness of its locking provisions, which are so devised that minimum stress is placed on lugs 30, but even so the reinforced shaping of the lugs makes them well able to take any shearing stress they may encounter. The carton obviously consumes a minimum of molded pulp paper for a self-locked type. The improved lock requires no special operation to engage it beyond a normal manipulation of the carton parts into closed position. Special lock interengaging procedures are avoided. Hence, there is no need, in a large scale egg room operation, for complicated or special closing machinery. From another equipment aspect, the locking lugs 30 and detent apertures 31 are all formed incident to a normal pulp molding procedure, not increasing in any degree the time or technical difficulties involved in making the carton.

The advantages of egg cartons embodying the invention have been described with particular reference to large scale egg packaging operations involving automatic machinery for closing and sealing the cartons. The simplicity of construction and the outstanding ease of operation of the locking mechanism also makes these cartons attractive and highly convenient for ordinary housewives. Unlike the egg cartons available heretofore, it is unnecessary for the housewife to place the carton on a support and then use both hands in order to unlock and open it. Instead, it is possible for her to hold the carton in one hand while quickly and easily unlocking and opening the carton with her other hand, in the manner described hereinbefore relative to FIG. 4 of the drawings. Furthermore, the readily and smoothly operable positive locking mechanism enables the housewife to perform these operations without jerking or straining the carton in any way, thereby greatly minimizing the danger of dropping and breaking the eggs.

In the single embodiment of the invention illustrated and described in detail, the egg carton is provided with two rows of six egg cells each, which is known as a two by six type carton. However, it is evident that the invention may be embodied advantageously in other types of cartons, such as the widely used three by four type egg carton. Furthermore, although it is highly desirable for the cover front wall 14 and the flange 26 to have mating scalloped configurations, it is also contemplated that these portions of the carton may be made perfectly flat. Likewise, although a preferred type of egg cell structure has been illustrated and described, it should be understood that other suitable types of cell structure may be employed in cartons embodying the invention, if desired, and that the cells may be adapted to contain fruit or other generally spherical objects instead of eggs.

It will be obvious to those skilled in the art that various changes may be made without departing from the spirit of the invention and therefore the invention is not limited to what is shown in the drawings and described in the specification but only as indicated in the appended claims.

What is claimed is:

1. In an integral and nestable egg carton made of relatively flexible molded pulp, a cellular tray portion having a front side, a rear side, and two ends, an inverted dished cover hinged to said tray portion, means for latching said tray portion to said cover with a latch located above said tray portion and extending completely through said cover from the inside to the outside, said tray portion having its front side strongly tied to its rear side by a plurality of spaced cell-forming partitions extending generally parallel to said tray portion ends, said partitions acting as means for preventing spreading of said front side from said rear side, said tray portion including egg cells adjacent but below the latching means, said inverted dished cover having a planar top, a front side, a rear side, and two ends, said front side being connected to said rear side only by said two ends and said planar top so that the front side is relatively flexible and is not rigidly tied to said rear side intermediate the ends of said front side, said front side of said cover having an opening formed therein through which the latch is adapted to extend completely from the inside to the outside, said dished cover being hinged to said tray portion along its rear side, a latch holding flap hinged to the front side of said tray portion, the hinge line connection of said cover with said tray portion and the hinge line connection of said latching flap with said tray portion being maintained parallel by said tying partitions even when the tray portion is loaded with eggs, said latch on said latching flap being located on one side of said tray portion which is opposite to the side where the cover is connected to the tray portion so that both the cover and the latching flap are each connected to the tray portion when the carton is open, said molded pulp egg carton being integrally formed with the latching flap, the upper edges of the two sides and the two ends of the tray portion, the upper edges of the two sides and two ends of the cover generally in the same plane and with the latch extending downwardly from the underside of the latching flap which is hinged to the front side of the tray portion and said latch being relatively close to the tray portion as compared with the opening in the front side of the cover which is relatively remote from the tray portion; when the tray portion is loaded with eggs and the latching flap is turned upwardly and the cover portion is rotated in a direction to telescope over the latching flap, the two hinge lines are relatively immovable but the front side of the cover may flex, whereby the loaded egg carton may be latched by simply rotating the latching flap upwardly and inwardly and rotating the cover upwardly and around the latching flap while the structural features maintain the geometric relation of the latch on the latching flap to the opening in the cover until the front side of the cover engages the latch on the latching flap and is cammed thereover until the latch on the latching flap registers with the opening in the front side of the cover whereupon the latch passes through the opening in the cover from the inside to the outside to effectively latch the carton.

2. A nestable molded pulp egg carton in accordance with claim 1, wherein the opening in the front side wall of said cover extends to the planar portion thereof and the latch on said latching flap is near the edge thereof which is remote from the hinge connection of the latching flap with the tray portion.

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MOLDED PULP CARTON

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Fig. 1

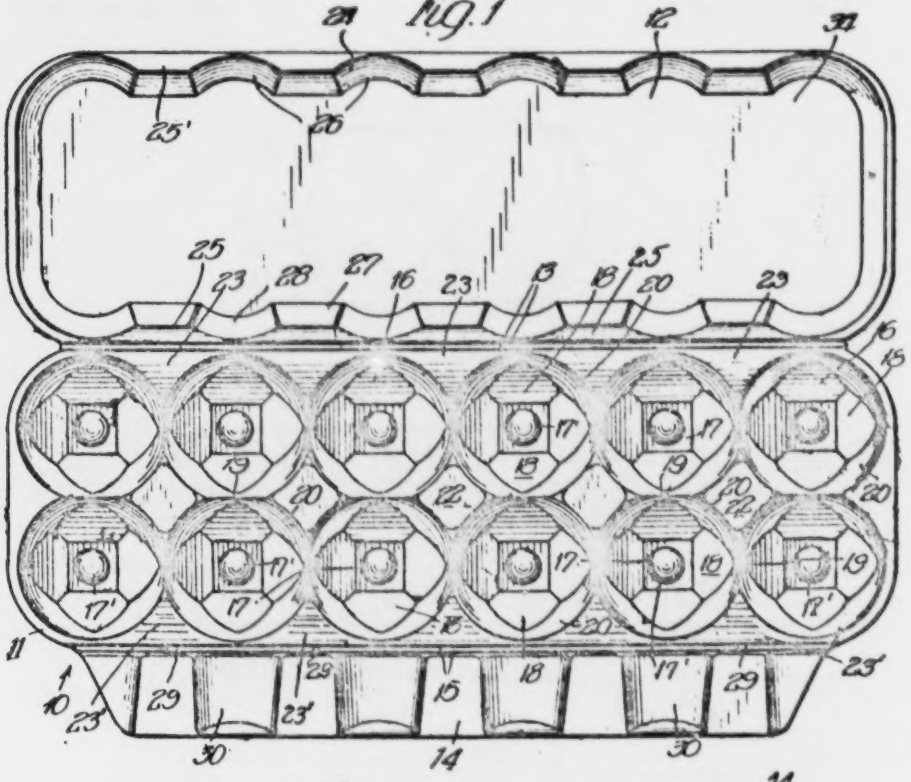


Fig. 2

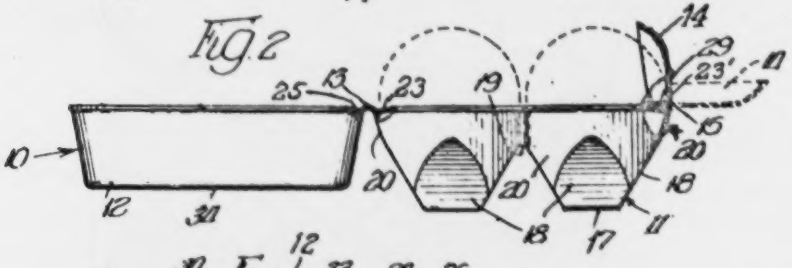
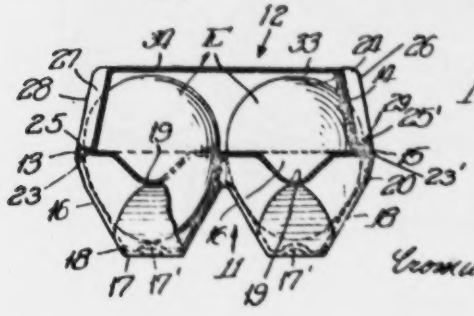


Fig. 3



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Nov. 20, 1956 J. W. COX 2,771,233

MOLDED PULP CARTON

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Fig. 4

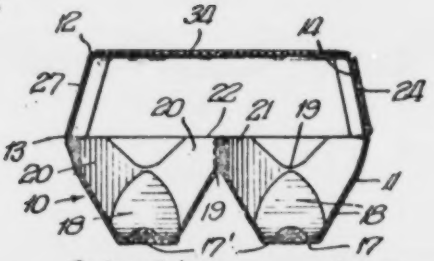


Fig. 5

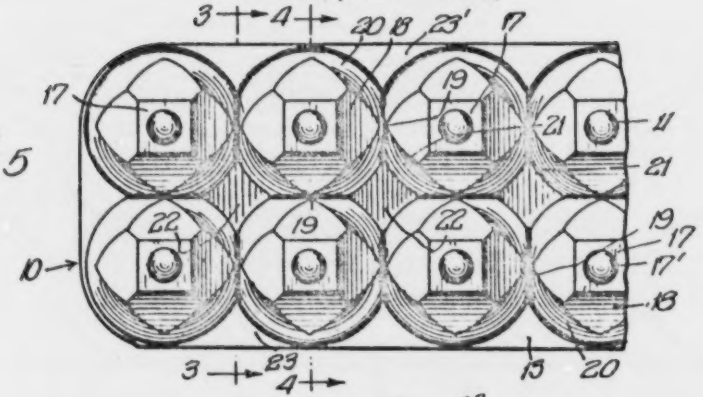
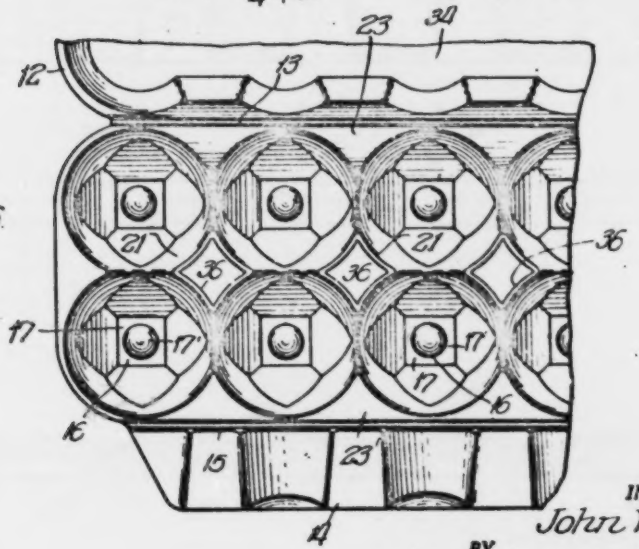


Fig. 6



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MOLDED PULP CARTON

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Fig. 7

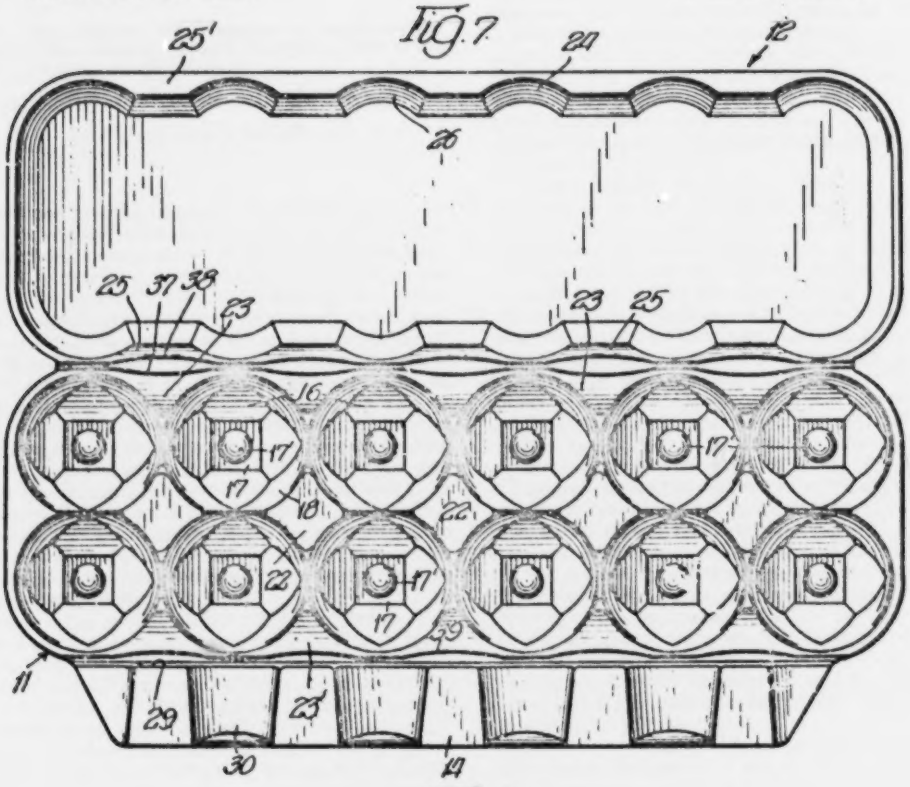
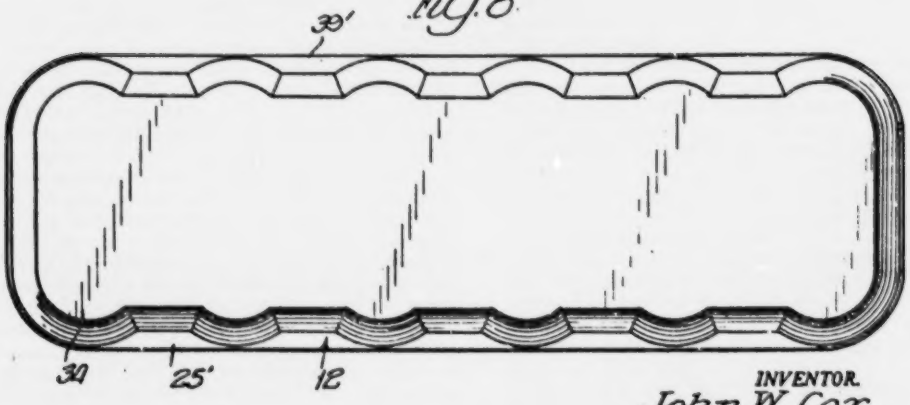


Fig. 8



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Appendix I

Nov. 7, 1950 J. W. COX 2,529,140

CARTON

Filed Nov. 22, 1947 2 Sheets-Sheet 1

Fig. 1.

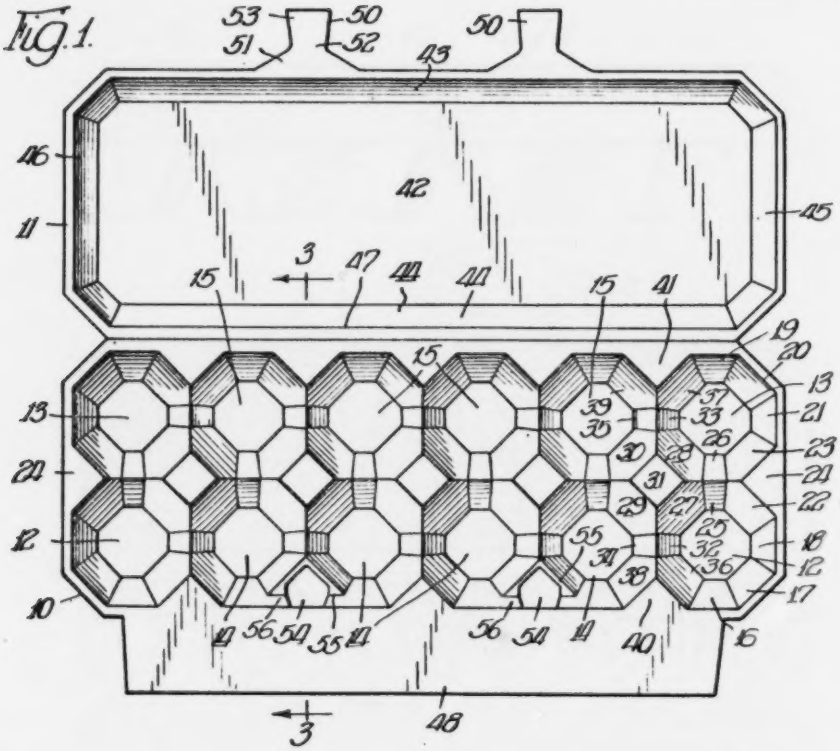


Fig. 2

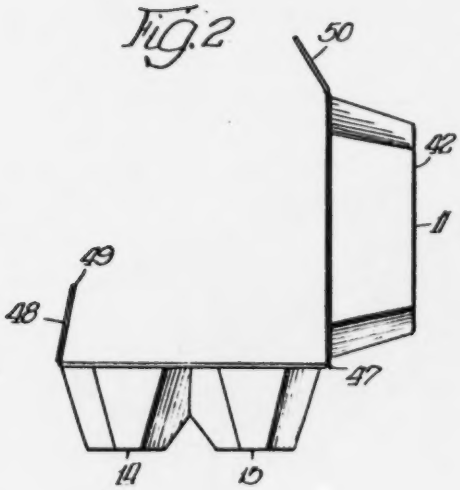
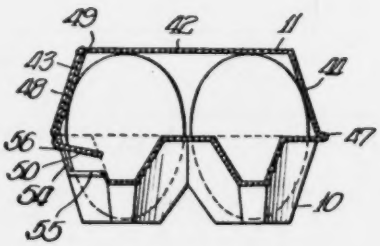


Fig. 3.



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CARTON

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Fig. 4

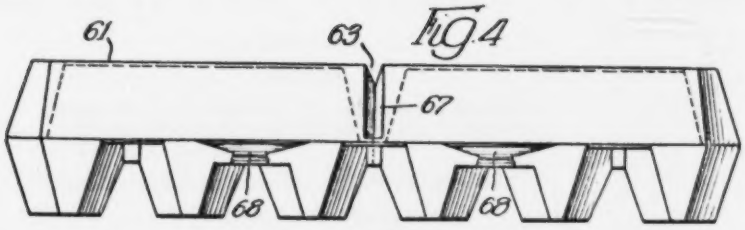


Fig. 5

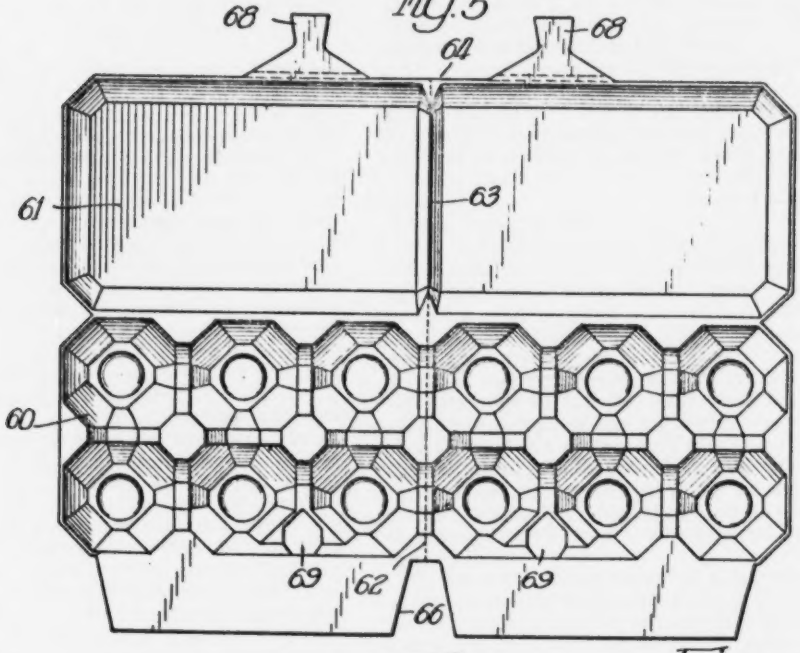


Fig. 6

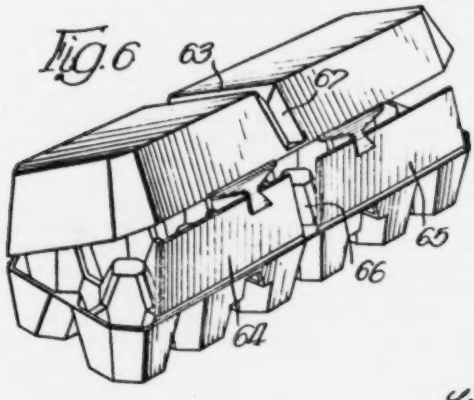
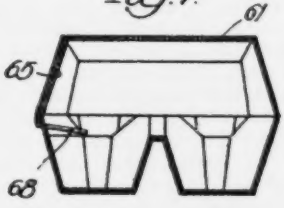


Fig. 7



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Patented Nov. 7, 1950 2,529,140

UNITED STATES PATENT OFFICE

2,529,140

CARTON

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Application November 22, 1947, Serial No. 787,521

10 Claims. (Cl. 229—2.5)

1

This invention relates to improvements in molded pulp cartons, particularly cartons for use in packaging eggs.

In the packaging of eggs two types of cellular cartons have been in general commercial use. One type which provides three rows of four cells for receiving a dozen eggs has been successively molded from a watery slurry of paper pulp fibers. The other type which provides two rows of six cells for the eggs and which is more desirable because it may be conveniently packed, when filled, in the standard 30-dozen capacity egg case or crate, in which eggs are handled and shipped in bulk lots, has been manufactured heretofore from the more expensive paperboard materials which can be cut, creased and folded to provide the desired cellular structure. A commercially successful molded pulp carton of the 2 x 6 type has not heretofore been produced.

In order to be acceptable commercially the 2 x 6 carton must be made the proper size to fit in the standard egg case after removal of the fillers and flats from the case, without any reduction in the total number of eggs per case. In order to provide a molded carton adapted for this type of case packing which will have adequate cell capacity to receive a dozen eggs in properly spaced relation, the carton must be molded without any appreciable laterally extending marginal portions, such as the marginal flange at the meeting line of the cover and bottom sections which characterizes the conventional 3 x 4 molded pulp egg carton. Without having the marginal flange to rely upon to prevent telescoping of the top and bottom sections, 2 x 6 carton constructions which have heretofore been proposed have lacked sufficient strength and rigidity to withstand vertical stresses and prevent crushing of the eggs when the cartons are placed in superimposed tiers in a case and subjected to the usual handling encountered in shipment. Failure of the previously developed cartons has been due to the fact that relative movement between the top and bottom sections has not been prevented in such cartons and adequate bracing of the top cover section to prevent its collapse under vertical stresses has not been provided for.

It is a general object of the invention to provide a cellular molded pulp egg carton which overcomes the deficiencies inherent in the 2 x 6 molded pulp egg cartons previously developed, which meets all the requirements of a strong, compact rigid container of the proper size to fit in the standard case, which houses the eggs in such a manner that the percentage of egg breakage in shipment is materially reduced and which may be more economically produced than the conventional paperboard egg carton.

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It is a specific object of the invention to provide a cellular molded pulp egg carton of the proper size to fit within a standard egg case and having an adequate top bracing structure combined with a locking means which cooperates with the bracing structure to prevent any appreciable relative movement between the top and bottom sections of the carton.

It is a further object of the invention to provide a cellular molded pulp egg carton of the type described having a flap formed integral with the marginal edge of the bottom section which flap extends substantially the length of the top section when the carton is in closed condition and lies adjacent the inner front wall of the top section with its edge in substantially abutting relation with the top wall of the top section to reinforce and rigidify the carton and effectively prevent the failure of the carton when subjected to the vertical stresses encountered in the customary shipment and handling of a plurality of such cartons arranged in superimposed tiers in standard egg cases.

It is a still further object of the invention to provide a molded pulp egg carton of the type described wherein the bottom section of the carton is provided with an integrally molded panel along a marginal edge which is adapted to be inserted in the top or cover section in juxtaposed relation with a generally vertical wall of the section and with its edge in substantial abutting relation with the planar top wall of the cover section and wherein integral locking elements are provided on the marginal edge of a wall of the cover section which are adapted to interlockingly engage, from the outside of the carton, in apertures provided in the adjacent wall of the bottom section to rigidly brace and lock the cover section to the bottom section of the carton and prevent any appreciable relative movement between the sections.

It is another object of the invention to provide a molded pulp carton of the type described which embodies the improved cover bracing flap and cooperating locking means and which is also divisible transversely of the carton to provide cellular carton sections having less than a dozen eggs therein.

These and other objects of the invention will be apparent to those skilled in this art from a consideration of the preferred form of the in-

vention which is shown by way of illustration in the accompanying drawing, wherein:

Fig. 1 is a plan view of a 2 x 6 carton which embodies the principles of the invention;

Fig. 2 is an end elevation with the cover section hinged to an upright position and with the bracing panel bent to position for insertion in the cover section;

Fig. 3 is a transverse section taken on the line 3—3 of Fig. 1;

Fig. 4 is a front elevation of a divisible form of 2 x 6 carton having incorporated therein the bracing and locking features of the invention;

Fig. 5 is a plan view of the divisible carton shown in Fig. 4;

Fig. 6 is a perspective view of the divisible carton with the cover in partially closed condition; and

Fig. 7 is a transverse section taken on the line 7—7 of Fig. 5.

Referring to Figs. 1 to 3 of the drawings, there is illustrated a 2 x 6 carton which embodies the principles of the invention and which is capable of being readily molded from a watery slurry of paper pulp fibers.

The illustrated carton comprises a cellular bottom section 10 and a top or cover section 11. The carton bottom section 10 is formed to provide two longitudinal rows of six cells each for accommodating a dozen eggs therein. Each egg-receiving cell is generally octagonal in shape and is defined by a bottom and upwardly sloping integral wall forming panel members, with adjacent panel members merging or connected at their upper ends by web portions which define partitioning formations extending longitudinally and transversely between the cells, in the manner described herewith.

The cellular bottom section 10 comprises front and rear, end, or corner, cells 12 and 13 which are disposed in transverse alignment to form a pair of cells at each end of the section and intermediate, front and rear cells 14 and 15 which are also disposed in transverse alignment to form four intermediate pairs of cells between the end pairs. The carton is symmetrical about a transverse center line and the four rear intermediate cells 15 are identical while the four front intermediate cells 14 are also identical except for certain adjoining wall structure which will be described.

The structure of each of the end cells 12 and 13 is the same. These cells differ only in their position relative to the adjoining cells. Outer panels 15, 16, 18 of the front end cell 12 and corresponding outer panels 19, 20, 21 of the rear end cell 13 extend upwardly to the substantially marginless upper edge of the bottom section 10 and define front and rear corner and end side wall forming portions for the section 10. Panels 22 and 23 which adjoin panels 18 and 21, respectively, extend upwardly and are integrally joined at their upper edges with a triangular web section 24 which extends inwardly from the top of the end edge of the section 10 to define the end portion of the longitudinal partition formation. Panels 25 and 26 of cells 12 and 13 extend upwardly and merge below the plane of the top edge of the section 10 to define an upstanding ridge-like portion of the longitudinal partition formation which adjoins the end portion thereof. A like partition formation is provided by the corresponding upwardly merging wall panels of each pair of transversely aligned cells. Panels 27 and 28 of cells 12 and 13 and the adjacent panels 29 and 30 of the adjoining intermediate cells 14 and 15, respectively, extend upwardly and are integrally joined at their upper edges by a rectangular horizontal web portion 31 to define a truncated intermediate partition formation. A like partition formation is defined by the corresponding adjacent wall panels of each set of four adjoining cells. These truncated formations combined with the triangle end partition formations and the intermediate ridge-like partition formations provide the longitudinal or medial partition which divides the cells into two longitudinal rows.

The wall forming panels 32 and 33 of the cells 12 and 13 extend upwardly and merge with the adjacent wall forming panels 34 and 35 of the adjoining intermediate cells 14 and 15 to form ridge-like partition portions extending transversely between the end pair of cells 12 and 13 and the adjacent intermediate pair of cells 14 and 15. The wall forming panels 36 and 37 of the cells 12 and 13 extend upwardly in merging relation with the adjacent wall forming panels 38 and 39 of the adjoining intermediate cells 14 and 15 and are integrally joined with triangular webs 40 and 41, respectively, which extend inwardly from the front and rear top edges of section 10, to form triangular transverse end partition formations. These formations combined with the central truncated partition formation and the connecting transverse ridge-like partition formations define the transverse partition between the pairs of cells. Each pair of cells is separated from the adjoining pair of cells by a like transverse partition. All the cells are provided with bottom members which integrally join the bottom edges of the wall forming panels and which constitute the bottom or supporting face of the carton.

The end wall forming panels 18 and 21 of the end cells 12 and 13 constitute the upwardly and outwardly sloping outer end wall faces or surfaces of the section 10 while the front and rear wall forming panels 16 and 19 thereof combined with the corresponding wall forming panels of the intermediate cells 14 and 15 constitute the outer side wall faces or surfaces of the section 10.

The carton cover section 11 is formed by integrally connected planar top wall 42, front and back side walls 43, 44 and end walls 45, 46. The front, side and end walls 43, 45 and 46 extend outwardly in angular relation to the top wall 42 and terminate in a substantially flangeless lower edge while the rear wall 44 extends in the same angular relation and is integrally connected by a hinge joint 47 with the upper edge of the rear wall formation of the bottom section 10. The end corners are formed to correspond with the end corners of the bottom section 10.

A cover bracing and reinforcing panel or flap member 48 is provided along the top edge of the front wall of the carton section 10. The panel 48 which is preferably molded substantially in the plane of the top edge of the section extends substantially the full length of the carton front wall and is adapted to be hinged to an upwardly extending position (Fig. 2) for insertion in the carton cover section 11 where it is received in juxtaposed relation to the front wall 43 of the latter with its free edge 49 in substantially abutting relation with the inner surface of the top wall 42 of the cover section when the cover section is in fully closed position.

The front wall 43 of the cover section 11 is

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provided with a pair of longitudinally spaced integrally molded locking tabs or tongue formations 50 each comprising a body portion 51, a reduced neck portion 52 and a wedge shaped head 53 which are molded in outstanding relation but which are adapted to be folded downwardly about the meeting edges of the bottom and cover sections of the carton when the cover section is in closed position.

The front wall of the bottom section 10 is provided with a pair of locking apertures 54 for cooperation with the locking tabs 50. The apertures 54 are located in triangular partition formations between adjacent intermediate front cells 14. A generally horizontal ledge 55 is formed intermediate the bottom of the section 10 and the top edge thereof which extends inwardly from a generally vertical wall section 56. The wall section 56 extends downwardly between the upper portions of the outer wall forming panels of the adjacent cells 14 and substantially in the same plane as the panels. The bottom portion of the aperture 54, which is in the horizontal ledge 55, is triangular while the upper portion of the aperture 54, which is in the wall section 56, is generally rectangular and somewhat narrower at the upper end thereof.

When the cover section 11 is hinged to the closed position with the bracing flap 48 in proper position within the cover section, the locking tabs 50 are bent downwardly around or over the meeting edge of the front wall portions of the bottom and cover sections and the heads 53 thereof are inserted in the apertures 54 in interlocking relation therewith. The bracing flap 48 is positioned between the top portions of the eggs positioned in the front cells 12, 14 and the cover front wall 43 and is retained in bracing relation with the cover section by the eggs. The bottom edges of the cover end walls 45 and 46 are supported on the inwardly extending abutment forming webs 24. The carton sections are held in closed relation by means of the locking tabs 50 which are securely fastened with their heads 53 in interlocking engagement in the apertures 54. The locking tab heads 53 are engaged in the apertures 54 by a downward and inward movement which positions the heads 53 in the space between adjacent eggs in the carton without danger of breaking the eggs. The arrangement provides a strong, rigid carton which can be successfully molded, which can be packed in the standard egg case as desired and which resists collapse and telescoping of the carton sections in a highly satisfactory manner.

The carton which is shown in Figs. 4 to 6 illustrates the invention embodied in a divisible carton. It comprises a cellular bottom section 60 and a cover section 61 which is hingedly connected thereto along the top edge of the rear wall thereof.

The bottom section 60 is molded to provide two longitudinal parallel rows of egg receiving cells 62 which are transversely aligned in pairs and separated by partition formations defined by merging wall forming panels, in the same manner as in the carton structure shown in Figs. 1 to 3, except for the ridge-like portions of the partition formations between the respective cells, which are flattened along the top edges of the merging wall forming panels constituting the same. The central transverse partition formation is provided with a perforated or weakened line 62 to facilitate separation of the carton into two portions of six cells each.

The carton cover section 61 is the same as in the non-divisible carton of Figs. 1 to 3 except for an inwardly extending dividing groove or valley 63 which extends transversely of the top and side walls thereof on the transverse center line and is provided with a perforated or weakened line 64 to facilitate separation of the carton into the two portions.

The carton bottom section 60 is provided along the upper edge of the front wall thereof with bracing panel members 64, 65 which correspond to the bracing panel member 47 of the non-divisible carton being separated adjacent the transverse center line by a space 66 sufficient to accommodate the front end 67 of the cover separating groove 63.

The cover section 61 is provided with locking tabs 68 which are identical in form with the corresponding tabs 50 in the non-divisible carton. The bottom section 60 is provided with cooperating apertures 69, which are identical with the apertures 54 for receiving in interlocking relation the heads of the locking tabs 68. The apertures 69 are located between the front cells which are immediately adjacent the transverse dividing line 62 of the carton so that when the tabs 68 are engaged therein the lock is closely adjacent the inner ends of the separated portions of the carton after it is divided. This construction insures greater rigidity in the separated portions.

The divisible carton is illustrated as separable along a transverse center line but the division may be along any other line or lines to divide the carton into portions of any desired size, the cover bracing flaps and the latching tabs being arranged as required by the location of the dividing line or lines to best serve the bracing and locking functions.

While specific details of construction and materials have been referred to in describing the illustrated forms of the invention, it will be understood that other details of construction and other materials may be resorted to within the spirit of the invention.

I claim:

1. A molded pulp carton, comprising a cellular bottom section having a cover-locking detent between adjacent cells, a non-cellular, tray-like cover section having top, front, rear and end walls, said cover being hinged to said bottom section along said rear wall, a cover bracing flap hinged to said bottom section and extending upwardly along the inside of the front wall of said cover section into generally upright bracing position with respect thereto when the sections are in closed relation, and a cover locking tab integral with the front wall of said cover, said tab being positioned in interlocking engagement with the detent in said bottom section from the outside of said carton.

2. A molded pulp carton, comprising a cellular bottom section, a non-cellular, tray-like cover section having a planar top and outwardly and downwardly extending planar front, rear and end walls, said cover section being hinged to said bottom section along said rear wall, a cover bracing flap hinged to the front wall of said bottom section and extending upwardly and inwardly along the inside of the front wall of said cover section to a position abutting the under side of said planar top when said sections are in closed relation, and a cover-locking tab integrally hinged to the front wall of said cover section to position the same between adjacent cells in said bottom section, said bottom section having a detent for

interlocking engagement with said tab, and said tab being engaged with said detent from the outside of said carton.

3. A molded pulp carton, comprising a bottom section having a row of downwardly extending cells spaced apart at their lower portion, said bottom section having a tab-receiving opening between adjacent cells, a non-cellular, tray-like cover section having top, front, rear and end walls, said cover section being hinged to said bottom section along said rear wall, an integrally formed extension on said bottom section forming a cover bracing panel adjacent the front wall of said cover, said panel being upwardly folded along the inside of said front wall into upright bracing position with respect to said cover when said sections are in closed relation, and an integral extension of said front wall forming a locking tab, said tab being interlocked with the opening in said bottom section from the outside of said carton.

4. A molded pulp carton, comprising a bottom section divided into cells, a non-cellular, tray-like cover section having a top and outwardly and downwardly extending front, rear and end walls, an integral cover bracing flange on one side of said bottom section and of substantially the same height as the height of the front wall of said cover section, said flange extending upwardly along the inside of said front wall into bracing relation with respect to said cover section, and means exteriorly movable when the carton sections are in closed relation for securing said bottom and cover sections in closed position.

5. A divisible molded pulp carton, comprising a bottom section having two rows of separated cells, two cover bracing flange sections integrally hinged along the front side of said bottom section, a non-cellular, tray-like cover section having a top and downwardly extending front, rear and end walls and having a transverse depression between the ends thereof, said flange sections having a space therebetween in alignment with the transverse depression in the cover section when the carton sections are in closed relation, said flange sections extending upwardly on the inside of the front wall of said cover section into bracing relation therewith, and means integral with said cover section and exteriorly movable into locking relation to said bottom section when the carton sections are in closed relation for securing said cover and bottom sections in closed relation, said securing means being arranged on opposite sides of the space between said flange sections whereby upon division of the carton the bottom and cover sections of the separated portions will be maintained in closed relation.

6. A molded pulp carton, comprising a bottom section having parallel rows of downwardly extending cells, adjacent cells in each row merging at their upper portions and being separated at their lower portions, horizontal cover bracing flange means integrally connected to the front side of said bottom section and composed of adjacent parts extending outwardly from a central portion of the carton between adjacent cells, said bottom section having hook-receiving openings between the cells next adjacent the inner portion of each of said parts, a non-cellular, tray-like cover section hinged to the rear side of said bottom and having a transverse depression adjacent the inner portions of said flange parts between said openings, and integral hooks on said cover for engagement with the openings in said bottom section from the outside thereof, said flange parts extending upwardly along the inner side of said cover into bracing relation with the upper portion thereof.

7. A molded pulp carton comprising a bottom section having side and end walls and means subdividing the space within said walls into cells, said means including transverse partition elements extending between and connected to said side walls, said bottom section being provided with a locking aperture in one of the side walls thereof between adjacent cells, a bracing flange hinged to said one wall above said aperture, a non-cellular, tray-like cover section having a top and side and end walls, one of said cover walls being hinged to the bottom section, said cover section being positionable with another wall thereof encompassing said flange in side-by-side relation in the closed position of said sections, said flange being of sufficient height to marginally engage and brace said cover section top in said closed position, and a locking element integrally projecting from said cover as a marginal extension thereof in alignment with said aperture and engaging the same to secure said cover and bottom sections in said closed position.

8. A molded pulp carton comprising a bottom section having side and end walls and means subdividing the space within said walls into cells, said means including transverse partition elements extending between and connected to said side walls, said bottom section being provided with a locking formation in one of the side walls thereof between adjacent cells, a bracing flange hinged to said one wall above said formation, a non-cellular, tray-like cover section having a top and side and end walls, one of said cover section walls being hinged to the bottom section, said cover section being positionable with another wall thereof encompassing said flange in side-by-side relation in the closed position of said sections, said flange being disposed at an angle to its associated wall in said closed position and being of sufficient height to marginally engage and brace said cover section top in said closed position, and a locking element projecting from said cover as a marginal extension thereof in alignment with said formation and engaging the same to secure said cover and bottom sections in said closed position.

9. A molded pulp carton comprising a cellular bottom section, a non-cellular, tray-like cover section provided with a planar top, said sections each being provided with integrally connected front, rear and end walls, the rear wall of said cover section being integrally hinged to the rear wall of said bottom section, a cover bracing flange integrally hinged along the front wall of said bottom section, and positionable within the front wall of said cover section and in side-by-side contact therewith throughout the entire inside height of said cover section front wall, said flange being of sufficient height to engage and brace the top of said cover section when said sections are in closed locked relation, and means to lock said sections in said relation.

10. A molded pulp carton comprising a cellular bottom section, a non-cellular tray-like cover section, said sections each including integrally connected front, rear and end walls and the cover section having a top panel extending between and integral with the walls thereof, the rear wall of said cover section being hinged to the rear wall of said bottom section, and a cover bracing flange integrally hinged along the front wall of said

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cellular bottom section, said flange being positionable within the front wall of said non-cellular cover section in side-by-side contact with said front wall in the closed relation of the sections and being of sufficient height to engage and brace the top panel of said tray-like cover section in said closed relation.

JOHN W. COX.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,223,872	Hartley et al.	Apr. 24, 1917
1,846,561	Koppelman	Feb. 23, 1932
2,061,064	De Reamer	Nov. 17, 1936
2,078,488	Farnham	Apr. 27, 1937
2,093,280	Koppelman	Sept. 14, 1937
2,100,516	Read	Nov. 30, 1937
2,285,129	Schwartzberg	June 2, 1942

170a

App - "J"

CHICAGO
NOV 11 1946
ILLINOIS

Sept. 14, 1937. M. KOPPELMAN 2,093,280

SELF LOCKING CARTON AND PACKING

Filed Dec. 6, 1934 2 Sheets-Sheet 1

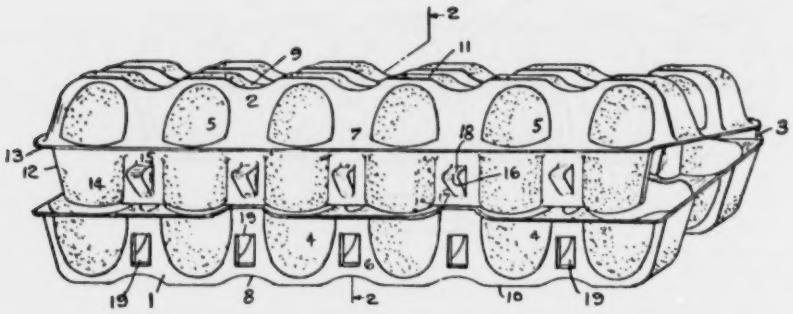

Fig-1

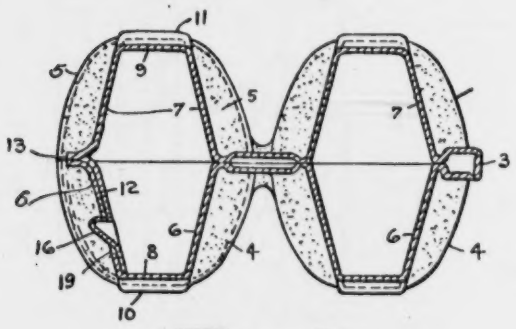

Fig-2

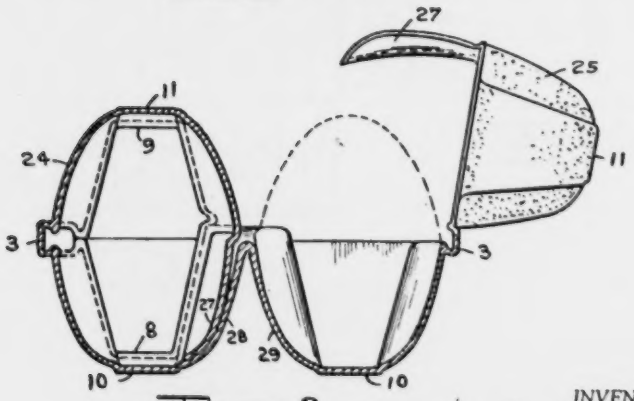

Fig-3

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Sept. 14, 1937. M. KOPPELMAN 2,093,280

SELF LOCKING CARTON AND PACKING

Filed Dec. 6, 1934 2 Sheets-Sheet 2

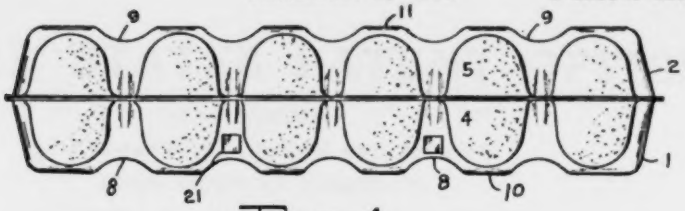

Fig. 4

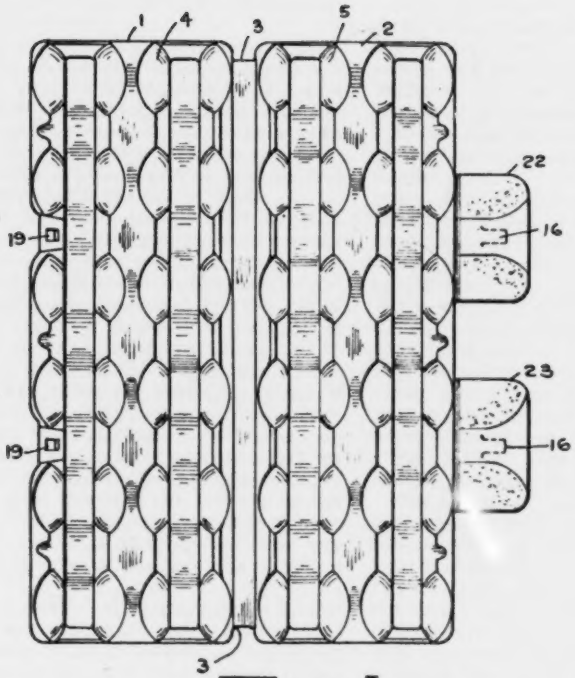

Fig. 5

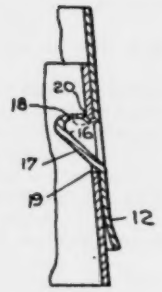

Fig. 6

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Patented Sept. 14, 1937

2,093,280

UNITED STATES PATENT OFFICE

2,093,280

SELF-LOCKING CARTON AND PACKING

Morris Koppelman, Brooklyn, N. Y.

Application December 6, 1934, Serial No. 756,227

5 Claims. (Cl. 229—29)

The improvements relate to cartons or carriers for eggs or other articles which require separation from one another and protection from injury through contact with one another or with other objects or by shocks or jars encountered in transportation and handling.

The primary object of the improvements is to provide a carrier of the kind indicated which will serve both as a packing for the articles and as a delivery carton and will be self locking, thus doing away with the necessity for an outer carton or wrapping and also all tying or fastening means, such as cord, hooks or clasps, and saving the time and expense involved in the use of these.

Heretofore it has been the practice to pack eggs and other fragile articles in boxes or cartons having "fillers" inside to receive, separate and protect the said articles, and to close such cartons by means of hooks, latches or the like either formed of the material of which the carton is made or of metal, or by wrapping the carton in strong paper or a paper bag and/or tie it with a cord. But even when the carton is made of stiff paper board the closures formed of the carton material are insecure and likely to yield or break and permit the carton to open and spill its contents, and where an outer wrapping or metallic fasteners or a cord are used the expense to the vendor of the articles in materials or time or both is considerable and substantially increases the cost to the consumer or reduces the vendor's profit.

When the cartons or carriers are made by the pulp sucking process and have article holding and protecting means integral therewith, the sheet material of which they are thus formed is too pliant and too easily fractured to permit of the formation of dependable fastening means integral therewith and of any known form. Many attempts have been made to provide such a fastening, but so far as can be ascertained they have all been unsuccessful, and no form of fastening has heretofore been devised which can be made integral with the carrier in the pulp sucking process and will provide a secure closure.

It will be understood that cartons or carriers can be made by the pulp sucking process in one molding operation thereby saving the labor and other cost involved in the fabrication of such an article from sheet material and at the same time provide a very efficient protective carton or carrier which has many advantages over those so fabricated. Examples of cartons or carriers of this type are shown in Patents No. 1,780,264 of November 4, 1930, and No. 1,846,561 of February 23, 1932, granted to me. The present improvements relate primarily to cartons of this character and of similar character made by the pulp sucking or molding process.

It is customary to make such cartons of a size to hold one dozen eggs, with the egg pockets or cells arranged in two rows of six each. Such a carton has been chosen for the illustrative embodiment of the invention shown in the accompanying drawings and referred to herein.

In the said drawings, Figure 1 is a perspective view of an egg carton embodying the improvements;

Fig. 2 is an enlarged vertical cross section of the carton shown in Fig. 1 closed, substantially on the line 2—2 in that figure;

Fig. 3 is a view similar to Fig. 2 showing a modification;

Fig. 4 is a front view of the embodiment of Fig. 1 slightly modified and on the same scale as Fig. 1, showing the carton in closed position, whereas in Fig. 1 it is shown partly open;

Fig. 5 is a plan of the embodiment of Fig. 4 showing the carton in open position, as it appears when it comes from the mold;

Fig. 6 is an enlarged vertical section of the locking members and adjacent parts.

The weight of eggs is relatively great, and as cartons and other devices in which they are sold to the consumer and carried must be of relatively light material, due to the cost of manufacture and raw materials and transportation costs, the problem of providing a marketable container in which these heavy fragile articles can be safely carried and handled is a difficult one. The problem of securing the carrier against accidental opening, without using wrapping paper, twine or metal fastenings or an extra outer carton is also serious, and in carriers made of molded pulp has heretofore so far as can be ascertained remained unsolved. By the present improvements a locking device which not only takes advantage of the weight of the eggs and their pressure against the walls of the carton is provided but one which may be easily secured and opened by a simple manipulation. At the same time the closure is such that it will secure the carton in closed position and maintain it in such position against all ordinary shocks and strains due to carrying and handling. It is also of such a character that it can be made complete in the single operation of molding the carton, and without any additional cutting, pressing or other operation.

In the said drawings, 1 represents the bottom and 2 the top section of an egg carton, these two

sections being joined along one edge by a hinge 3 on which they are folded. 4 represents the lower and 5 the upper cups of the carton, which when the carton is folded over and closed constitute egg holding cells. Between these cups are connecting and spacing portions 6 and 7 respectively, and these portions are indented at their outer extremities as shown at 8 and 9, while the extremities opposite the cups are flat, as shown at 10 and 11. These flat portions 10 and 11 provide a secure base upon which the carton may rest and also afford a surface which may be used for printing names, dates, or other matter, if desired. The portions 8 and 9, being arched, tend to strengthen the top and bottom of the carton and also afford a grip for the fingers, when the carton is handled.

In the form of Figs. 1 and 2, a continuous flap 12 runs along the outer longitudinal edge of the upper section 2 and is connected therewith by a hinge 13 formed of a narrow strip of material running between the said section and the flap with a weak line along its center. The flap is molded in open position and extending from the body of the carton in a substantially horizontal plane, as are also the short, separate flaps of the modified form shown in Figs. 4 and 5, so that the first user can on closing the carton on the hinge member 3 turn the flap in to a position substantially at right angles to its original position and slip it inside the outer forward wall of the bottom section 1. This flap is not flat, but is provided with alternate curved portions 14 and relatively flat portions 15 throughout its length, approximating the alternated cups and connecting portions 4 and 6 in contour, but approaching the planiform slightly, so that when forced in between the eggs and their cups and inside the connecting portions 6 it will be placed under tension and distorted slightly, causing substantial frictional coaction tending to hold it in this position. This frictional coaction is also increased by the tendency of the flap to return to its original position which causes it to press outwardly against the inner wall of the lower carton section and causing its button members to be constantly pressed through the apertures in said section.

The flap 12 is provided with a series of button members 16 projecting therefrom, and formed therein in the molding operation. Each of these button members has an inclined face 17 and an abrupt face 18, and the abrupt face is preferably made thinner than the inclined face, so that the edges 20 of the aperture 19 will tend to bite into it and prevent the button member from slipping out easily (see Fig. 6). These button members may have any serviceable form, but the form shown has been found effective and satisfactory, since it facilitates the insertion of the flap inside the wall of the bottom section, by reason of its beveled lower portion, snaps into the apertures 19, and holds the flap against withdrawal, by reason of the abrupt face 18. The apertures 19 are also formed in the operation of molding the carton, and may have any satisfactory form. In the embodiment shown they are substantially oblong rectangles, corresponding in size and shape to the base of the button members 16, and just large enough to receive the said members and permit them to project therethrough and beyond the wall of the carton section, in which position they are held by the outward pressure of the flap and the pressure of the eggs in the adjacent cells against it. It will be seen that as the flap 12 is forced in between the eggs and the walls of the lower cups and below the greatest horizontal diameter of both, there will be a substantial gripping of the flap which will prevent it from being easily withdrawn and assist the buttons and apertures in holding it and the sections of the carton securely closed.

The apertures 19 are preferably holes extending through the front wall of the lower carton section, but may be relatively deep recesses or indentations. Such a recess is shown at 21 in Fig. 4. The form shown in Fig. 1, however, has been found desirable not only because it provides relatively sharp edges to engage the button members but because it can be produced in the molding operation by inserting an imperforate piece of sheet metal in the wire mesh of which the molding form is usually made, so that no pulp adheres to the form at that point and an opening is left. The weak portion of the abrupt face 18 of the button may be produced by having the mesh of the screen molding form closer at that point than elsewhere, and thus causing the deposit of a thinner layer of pulp fibres thereon.

In the modified form of Figs. 4 and 5, instead of having a continuous flap along the outer edge of the upper carton section two separate flaps 22 and 23 are employed, each with a button member 16 thereon, and two apertures 19 in line therewith are provided in the forward outer wall of the lower section; otherwise the construction is the same. It will be understood that more than two of these flaps may be employed, and that the apertures may be in the flaps and the button members in the wall, if such an arrangement can be manufactured to advantage.

In the modification of Fig. 3, the upper carton section is made in two parts 24 and 25, each hinged to an outer longitudinal edge of the lower section. In this case each upper part is provided at its outer edge with a flap 27 similar to 22 and 23 or 12, and having substantially the same contour. In this case an effective closure is provided without the employment of the button and socket devices 16, 19, as the flaps are forced in between the inner walls 28 and 29 of the bottom section and the eggs in its pockets. The button and socket or aperture arrangement may, however, be employed in this modification, and for some purposes the said arrangement may be omitted in the form shown in Fig. 1, and the frictional coaction between the flap and the wall and pocketed articles depended on to hold the flap and maintain the closure.

In the use of the device, the eggs or other articles are first placed in the pockets of the lower section and the upper section folded thereover, or otherwise placed thereon, so that its pockets register with the pockets of the lower section and form cells for the said articles. When the flap or flaps of the upper section have their outer edges at the upper edges of the lower section they are pressed inwardly so that their said outer edges enter inside the said upper edge. The top or cover section is then pressed home, forcing the flap or flaps down and between the eggs and the lower walls of their cells and causing the button members to snap into the apertures—where said button members and apertures are employed. To open the carton it is only necessary to press with one finger against the top of the wall which is engaged by the flap, push it outward slightly and pull quickly on the upper section adjacent the flap.

Various modifications in the construction and arrangement shown and described may be made

without departing from the scope of the present invention, two of the most important features of which reside in the construction and arrangement whereby the weight and pressure of the articles in the carton are employed in part to hold the closure and whereby the entire carton and its locking means may be made in a single molding operation.

The molding operation employed is the usual pulp sucking method of molding in which the foraminous forms are passed through a bath of pulp fibres, with their outer surfaces exposed to said bath, while suction is maintained on the opposite side of said forms to draw the fibres against the forms and cause them to form a film or sheet thereon. The forms are then removed from the bath, with these molded sheets thereon, and the sheets then removed and dried. The cartons or carriers embodying the present improvements may however be made by other methods, such as certain paper making methods in which the pulp is sprayed or flowed on to the plates, and in which suction may or may not be employed. But the method or process referred to herein is the most efficient and satisfactory method heretofore practiced for the manufacture of non-planiform sheets of fibres, and the construction and arrangement embodying the improvements has peculiar advantages in connection with the practice of the same, while the said method or process has a peculiar relation to the cartons or carriers embodying such improvements.

Instead of providing the abrupt face of the button member with a weak, yielding portion it may have an aperture therein, formed in manner similar to the aperture 19, and this aperture—or the weak portion—may extend slightly into the adjacent sides thereof, as indicated by dotted lines at 18' in Fig. 6, and instead of inserting an imperforate piece of metal in the foraminous mold or form the small interstices of the form may be filled or closed up by solder or brazing or in other manner where the apertures are to be formed. Various other modifications in or equivalents for the parts described and the method of producing the same may be employed without departing from the scope of the invention.

What I claim is:

1. In a device of the character indicated, a non-planiform, fibrous sheet comprising a plurality of sections having article-receiving recesses therein, one of said sections adapted to be placed upon the other to form a hollow container, a curved extension on one edge of one of said sections normally projecting beyond the other section when said first section is superposed and below the upper portion thereof, said extension being adapted to be passed into the other section between the wall of an article-receiving and article contacting recess of said other section and an article in said recess and partly beneath said article, whereby said two sections are secured together in closed article-containing position.

2. In a device of the character indicated, a non-planiform, fibrous sheet comprising a plurality of sections having article-receiving recesses therein, one of said sections adapted to be placed upon the other to form a hollow container, an extension on one edge of one of said sections normally projecting beyond the other section when said first section is superposed, said extension being adapted to be passed into the other section between the wall of an article-receiving and article contacting recess of said other section and an article in said recess, whereby said two sections are secured together in closed article-containing position, said extension and wall having one of them an aperture for receiving a button member on the other, and a button member projecting from the other and integral therewith, and constructed and arranged to engage said aperture at a point in the plane of a portion of said article.

3. In a device of the character indicated, a non-planiform, fibrous sheet comprising a plurality of sections having article-receiving recesses therein, one of said sections adapted to be placed upon the other to form a hollow container, an extension on one edge of one of said sections normally projecting beyond the other section when said first section is superposed, said extension being adapted to be passed into the other section between the wall of an article-receiving and article contacting recess of said other section and an article in said recess, whereby said two sections are secured together in closed article-containing position, said extension and wall having one of them an aperture for receiving a button member on the other, and a button member projecting from the other and integral therewith, and constructed and arranged to engage said aperture at a point in the plane of a portion of said article, and said button member having an inclined face toward the outer edge of the extension.

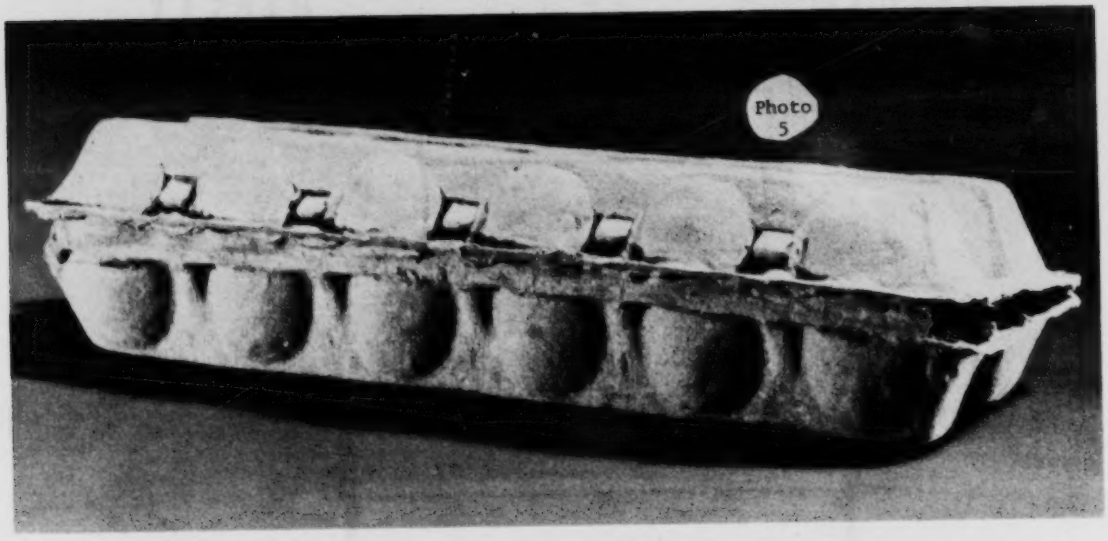
4. In a packing device for fragile articles comprising a fibrous sheet having article-engaging formations therein and adapted to receive and hold such articles, there being an aperture in one side of the sheet, a projection in the other side of the sheet adapted to engage in said aperture to secure the sides of the sheet together, said projection having a face adapted to engage an edge of said aperture and a non-resisting portion at said face adapted when the sides of the sheet are subjected to separating strain to permit said edge to enter beneath the top of said projection and hold said portions of the sheet against relative lateral movement.

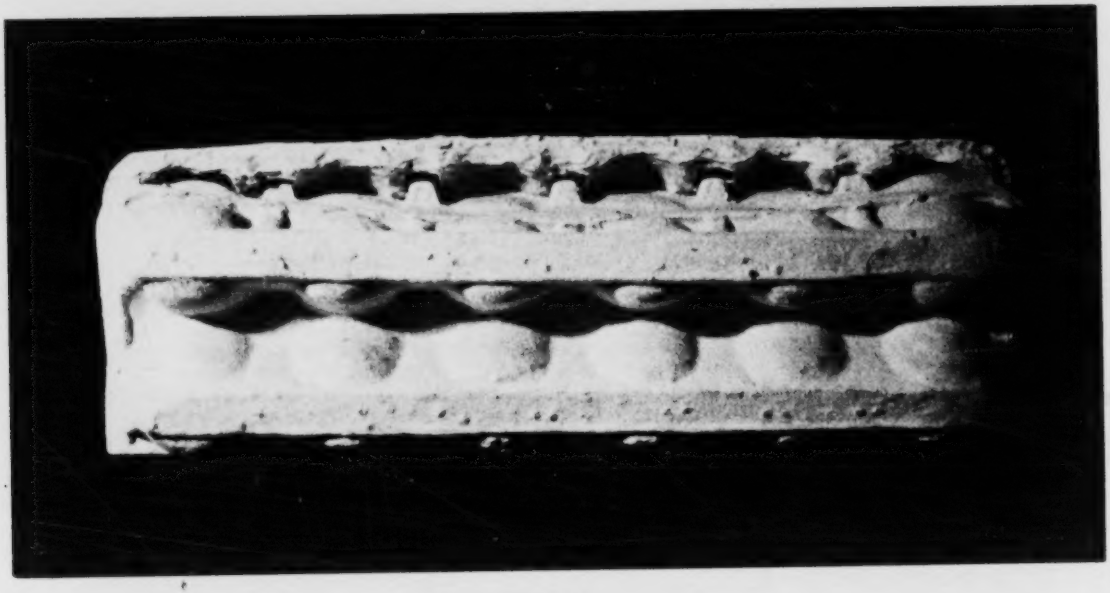
5. In a device of the character indicated, a non-planiform fibrous sheet having article-receiving compartments therein, a second sheet adapted to be placed upon the first sheet to close the same and form a hollow container, a curved extension on the second sheet normally projecting beyond and overlapping a portion of the first sheet and extending into at least one article-receiving compartment thereof when the sheets are in superposed relation and below the upper portion thereof, said extension being adapted to pass between a wall of an article-receiving compartment and an article therein and partly beneath said article, whereby said two sheets may be secured together to form a closed container with articles therein, the said extension and compartment wall being constructed to engage each other and the extension to exert pressure between said wall and the article, whereby the container is secured in closed condition by frictional coaction between the parts.

MORRIS KOPPELMAN.

This photograph of DX 94 corresponds generally to [illegible] hereof but with the carton in the fully closed and locked position. This photograph is presented for comparison to the Reifers patent in suit."

[Underlining Added]





DX-94

This photograph of DX 94 was taken by plaintiff from a different angle.

Both photographs show the "bow" of the hinge line corresponding to partial collapse of front wall of the flap bearing member. The buttons do not and cannot make a satisfactory lock. Further pressure from outside the carton on the member provided with holes would only push the buttons in.

Case A.

John W. Tuttle's

Imp. Packing Box.

117349 PATENTED JUL 25 1871

Fig 1

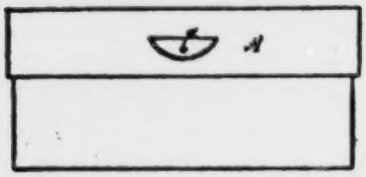


Fig. 2.

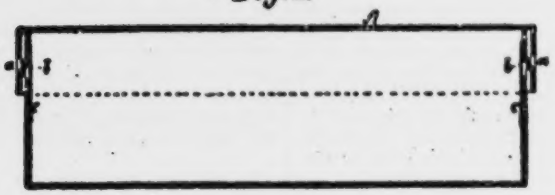


Fig. 3

Fig. 4.

Witnesses
S. N. Piper.
L. N. Miller

John W. Tuttle
by his attorneys.
R. H. Eddy

1780

UNITED STATES PATENT OFFICE.

JOHN W. TUTTLE, OF NEWTON, MASSACHUSETTS.

IMPROVEMENT IN PASTEBOARD PACKING-BOXES.

Specification forming part of Letters Patent No. 117,349, dated July 25, 1871.

To all whom it may concern:

Be it known that I, JOHN W. TUTTLE, of Newton, of the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Paper or Pasteboard Packing-Boxes; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawing, of which—

Figure 1 denotes an end view, and Fig. 2 a longitudinal section of a packing-box and cover provided with my invention. Fig. 3 is an end view of the cover; Fig. 4, an end view of the box or body part thereof.

In carrying out my present invention I form each end or side of the cover A with a segmental slot or opening, *a*, going through it. I also construct the body of the box, at each of the opposite ends or sides, with similarly-shaped projections *b b*, which may be formed by making areal cuts through the end or side of the box and bending outward on their chords the segments included within such areal cuts. A thin covering, *c*, of cloth or paper, may be pasted over each of such segmental openings in the ends or sides of the body, so as to close the opening; and, if desirable, there may be a stuffing of paper or otherwise introduced between the covering and the part cut and pressed out, the stuffing being to fill the space between the two. I generally prefer to dispense with the paper covering and the stuffing, and to leave the projecting part *b* flexible, or with its inherent elasticity, in order to enable it to be pressed inward when necessary. The segmental holes in the cover and the segmental projections of the body of the box are to be so arranged that, on pulling the cover on the body, the projections may be caused to enter the holes and with them serve to hold the cover in place on the body. By pressing inward the end or side of the box where such a projection may be, the latter may be forced out of its hole in the cover, so as to allow of the cover being easily removed from the body.

The object or purpose of my additions to the common pasteboard box is to dispense with the employment of strings, fastenings, or wrappers, such as ordinarily used, or are commonly employed by packers or others, for confining the covers to the bodies of packing-boxes.

Common pasteboard packing-boxes, as generally made, and as used by manufacturers, or in stores or elsewhere, for the package or preservation of small wares or light articles of merchandise, are very liable to have their covers displaced from the bodies. As a consequence this necessitates the employment of strings or other fastenings going wholly or partially around the boxes; such methods of confining the covers in place being oftentimes expensive and attendant with loss of time and material, which by my invention are saved; and, furthermore, my invention saves the labor and time required for relieving the covers of such means or methods of retaining them in place, and is a valuable and very important improvement, as, for all ordinary purposes, the cover will be kept in place without the necessity of being wrapped or tied down upon the body.

In some respects my present invention is analogous to that for which Letters Patent No. 101,516, dated April 5, 1870, have been granted to me. It differs therefrom, however, in having the segmental cuts or holes made through the sides or ends of the cover, and to operate with the segmental projections formed on the body, as set forth. I herein make no claim to the subject of such patent.

What I claim as my present invention is—

The improved pasteboard packing-box, as provided with slots arranged through the sides or ends of its cover, as described, and with corresponding projections to enter such, arranged and formed on or from the body, as set forth.

JOHN W. TUTTLE.

Witnesses:

R. H. EDDY,

J. R. SNOW.

406,159 COMPLETE SPECIFICATION 1 SHEET

[This Drawing is a reproduction of the Original on a reduced scale.]

FIG.1.

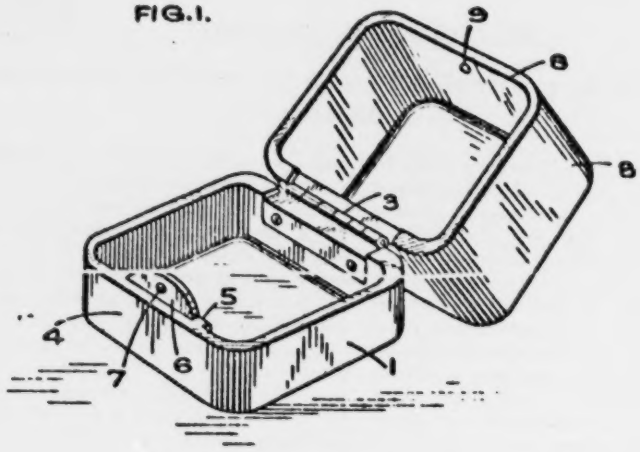


FIG.2.

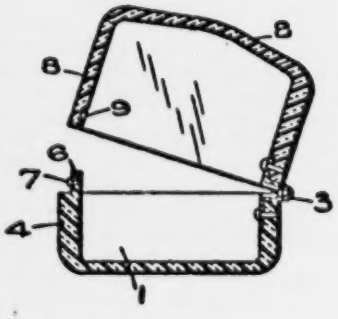
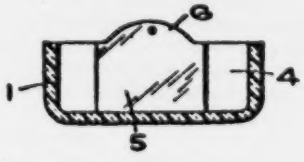


FIG.3.



Malby & Sons, Photo-Litho

PATENT SPECIFICATION

Application Date: May 11, 1933. No. 13,680/33. 406,159

Complete Accepted: Feb. 22, 1934.

COMPLETE SPECIFICATION.

Improvements in Boxes or Cases for Jewellery or other Light Articles.

PATENT OFFICE LIBRARY

We, HERBERT STUDDY HOOPER, and HENRY JAMES WHITEHOUSE, both Subjects of the King of Great Britain, and both of 32, Frederick Street, Birmingham 1, in the County of Warwick, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to boxes or cases for jewellery and other light articles and of the type having a body to which a lid is hinged, a fastening being provided usually including a projection associated with the one part which can be sprung into engagement with the other part.

It has been proposed to construct a metal box or case with a fastening including a resilient tongue or catch integral with one part and adapted for engagement with the other part to retain the lid in the closed position.

It has also been proposed to form moulded boxes with one or more moulded integral projections on one part, each adapted for engagement in a recess in, or with the overhanging edge of, the other part, to retain the hinged lid or the two box parts in the closed position.

The object of the present invention is to provide an improved or modified construction.

According to one aspect of this invention we provide a moulded box or case of the type set forth for jewellery or other light articles, comprising two parts hinged together one of the parts having a resilient portion moulded integrally therewith, such portion being provided with a metal catch for engagement with a co-operating portion of the other of said parts of the box or case.

According to a further aspect of the present invention we provide a moulded box or case of the type referred to for jewellery or other light articles and having an upstanding tongue or the like formed integrally with one part, said tongue carrying a metal catch or projection for engaging the other part to retain the lid in the closed position.

The body or lid may be made for example, from synthetic resin, and on one of these and at the edge which is disposed opposite to the hinge, an integrally upwardly projecting resilient tongue may be formed, the said tongue carrying a metal rivet or projection adapted to engage in a recess in the other part of the box when the box is closed.

In order that our invention may be clearly understood and more readily carried into practice, we have appended hereunto one sheet of drawings illustrating the same, wherein:—

Figure 1 is a perspective view showing one form of our invention.

Figure 2 is a sectional side view.

Figure 3 is a sectional end view.

In the construction illustrated, the box comprises a body 1 and a lid 2 connected by a hinge 3. The parts 1 and 2 may be produced by a moulding of synthetic resin.

The side 4 of the body 1 which is opposite to the hinge 3 has its centre part 5 thickened and provided with an upwardly projecting integral tongue 6 in which is fixed a pin having a projecting head 7.

The material of the tongue 6 is relatively thin and somewhat resilient.

The side 8 of the lid 2 opposite to the hinge 3 is provided with a recess 9 which, when the box is closed, is sprung over the projecting head 7 so that the box is retained closed.

The combined resiliency of the tongue 6 and the side 8 of the lid is sufficient to enable the box to be opened and closed by the exercise of a little pressure.

In the drawings the invention is shown as applied to a box for containing a ring, but it is to be understood that it can be applied to boxes of all other shapes and proportions for containing jewellery or other light articles.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A moulded box or case of the type set forth for jewellery or other light articles, comprising two parts hinged together one of the parts having a resilient portion moulded integrally therewith,

such portion being provided with a metal catch for engagement with a co-operating portion of the other of said parts of the box or case.

2. A moulded box or case of the type set forth for jewellery or other light articles and having a projecting tongue or the like formed integrally with one part, said tongue carrying a metal catch or projection immovably associated therewith for engaging the other part to retain the lid in the closed position.

3. A moulded box or case according to Claim 2 wherein the tongue or the like is formed on a thickened portion of the wall of the body of the box and the catch or projection is engageable resiliently with a recess formed in the interior of the lid.

4. A moulded box or case according to Claim 1 or 3 wherein the projection comprises the head of a rivet secured in a hole in said resilient tongue.

5. A box or case for jewellery or other light articles, substantially as described with reference to the accompanying drawings.

Dated the 9th day of May, 1933.

FORRESTER, KETLEY & Co.,
Chartered Patent Agents,
Central House, 75, New Street,
Birmingham 2, and,
Jessel Chambers, 88/90, Chancery Lane,
London, W.C. 2.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1934

B. F. HUNZIKER.

CIGARETTE CASE.

APPLICATION FILED MAR. 8, 1920.

1,354,042. Patented Sept. 28, 1920.

Fig. 1

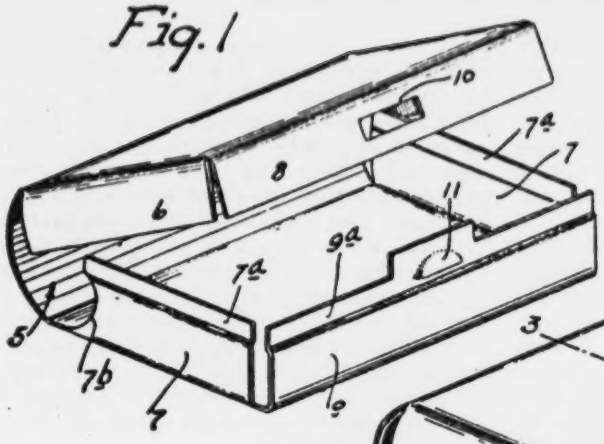


Fig. 2

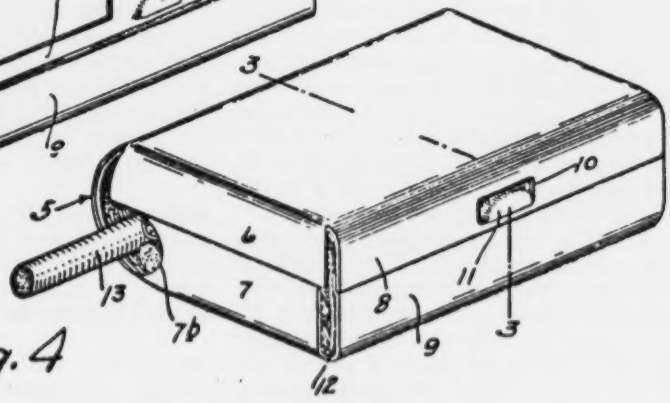


Fig. 4

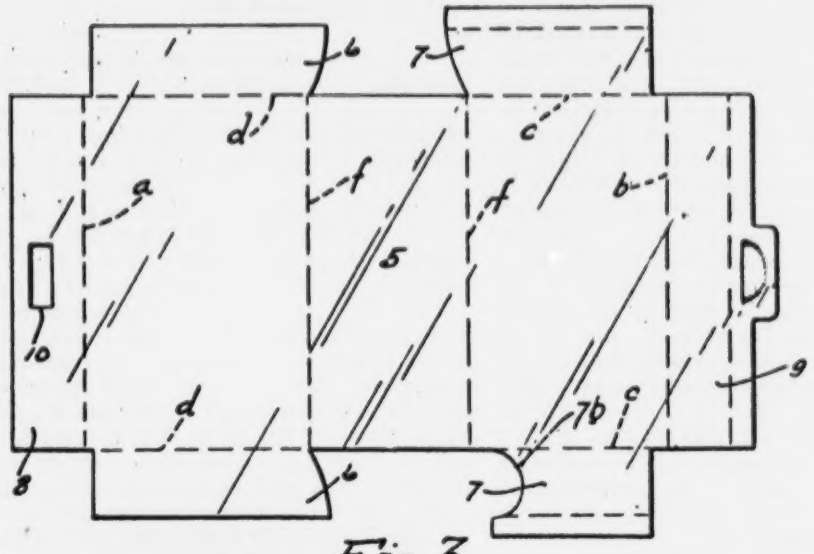
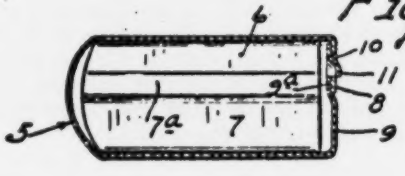


Fig. 3



INVENTOR
Benjamin F. Hunziker
BY HIS ATTORNEYS
Williamson & Merchant

UNITED STATES PATENT OFFICE.

BENJAMIN F. HUNZIKER, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO JULIUS F. HUNZIKER, OF MINNEAPOLIS, MINNESOTA.

CIGARETTE-CASE.

1,354,042. Specification of Letters Patent. Patented Sept. 28, 1920.

Application filed March 8, 1920. Serial No. 364,057.

To all of whom it may concern:

Be it known that I, BENJAMIN F. HUNZIKER, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Cigarette-Cases; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an extremely simple and highly efficient cigarette case adapted to hold and protect a package of cigarettes and to permit the ready discharge therefrom of the cigarettes, one at a time.

The complete case is made from a single piece of thin sheet metal bent to form an inclosing box-like structure adapted to be opened up by a hinge-like action to permit the cigarette packages to be inserted therein or removed therefrom.

The improved case is indicated in the accompanying drawings wherein like characters indicate like parts throughout the several views.

Referring to the drawings:

Figure 1 is a perspective view showing the case opened up;

Fig. 2 is a perspective view showing the case closed and a package of cigarettes therein contained;

Fig. 3 is a transverse section through the case on the line 3—3 of Fig. 2; and

Fig. 4 is a plan view showing the stamped blank of sheet metal before it has been bent to form the case.

Referring first to Fig. 4, the numeral 5 indicates the body of the sheet metal blank, the same being formed with projecting wings 6 and 7 at its opposite edges and with extensions 8 and 9 at its opposite ends. This blank is adapted to be folded on the dotted lines *a*, *b*, *c*, and *d*, to throw, respectively, the end portions 8 and 9 and wings 6 and 7 at approximately right angles to the flat surfaces of the sheet 5. Also, the blank 5 will be slightly bent on lines indicated by the dotted lines *f*, so as to bend the portion between the said lines *f* into something less than a semi-circle, so that the spring wall or portion between the lines *f*—*f* will tend to hold the sides of the case separated or open, as shown in Fig. 1. By reference to Figs. 1, 2 and 3, it will now be noted that the wings 6 and 7 form the end flanges of the case and that the end extensions 8 and 9 form two cooperating edge forming flanges of the case, while the spring portion between the lines *f*—*f* forms the other edge of the case, the latter being a curved formation. It will also be noted that the edges of the flanges 7 and 9 are slightly inwardly offset at 7^a and 9^a, so that the flanges 6 and 8, respectively, will overlap therewith and stop against the shoulders thus formed when the case is closed, as shown in Fig. 2.

The edge flange 8 is formed with a notch 10, and the offset portion 9^a of the edge flange 9 has an outwardly pressed boss 11 that is beveled on its upper side and terminates in a sharp shoulder. When the case is closed, the boss or lug 11 will cam itself into interlocking engagement with the notch 10, and to release the same from the said notch when it is desired to open the case, the flange 9 must be sprung inward by pressure from the fingers.

It will be further noted that all but one of the end forming flanges 6 and 7, at their inner ends, are rounded, so that, in a closed case, they project nearly to the rounded edge of the case and prevent cigarettes from escaping from a closed case: but the inner end of one of the flanges 7 is cut out or notched at 7^b, so that it leaves a passage amply large for cigarettes to be dropped or pulled from the case.

In Fig. 2, the numeral 12 indicates a paper package containing cigarettes 13. Before the package of cigarettes is placed in the case, part or all of one end of the paper package 12 is torn off, so that the cigarettes may be discharged, one at a time, from the case.

As is evident, this case will not only hold a package of cigarettes and protect the same from breakage or crushing, but permits the cigarettes to be taken from the case quickly when desired. Obviously, the case is adapted to be carried in the pocket and is but slightly larger than a paper package containing the cigarettes. The facility and ease with which the package of cigarettes can be placed in the case is also evident.

What I claim is:

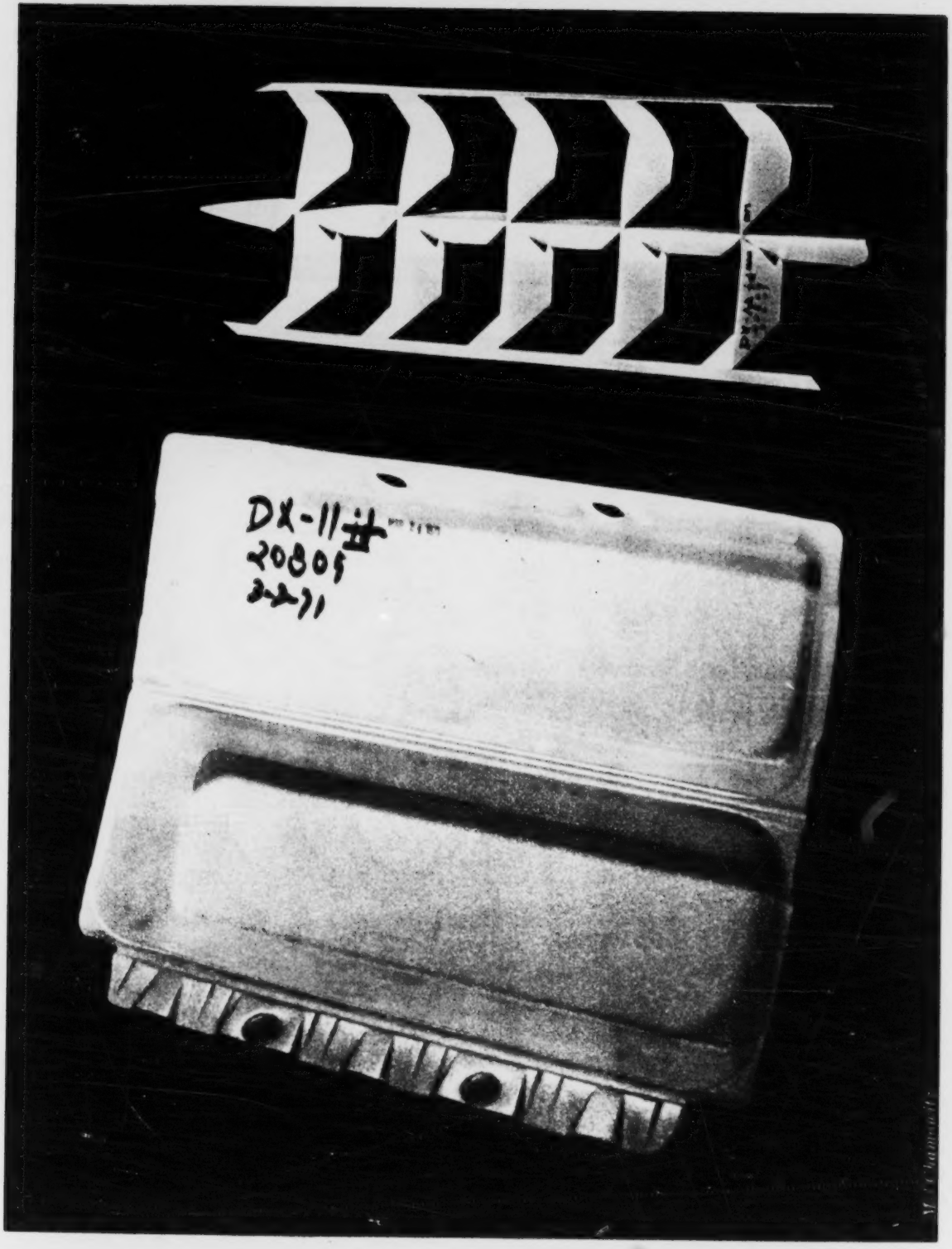
A cigarette case formed from a single piece of sheet metal bent on a curve at its

intermediate portion to form a bowed spring acting edge wall, tending to open the case, and with the two sides forming portions of the sheet at their edges and ends having coöperating lapping flanges, said edge forming flanges having yieldingly engaging interlocking elements, and one of said end forming flanges adjacent to the bowed edge of the case, having a passage that is always open when the case is closed, to permit the endwise discharge of cigarettes, one at a time, all of the other edge forming flanges having curved ends located immediately adjacent to said bowed edge of the case, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

BENJAMIN F. HUNZIKER.

Witnesses:
J. F. HUNZIKER,
HARRY D. KILGORE.



DX11
AND DX12 USED AT LAWRENCEVILLE DEMONSTRATION

Aug. 27, 1968 G. A. SNOW ET AL 3,398,875

EGG CARTONS

Filed Dec. 30, 1966 3 Sheets-Sheet 1

Fig. 1.

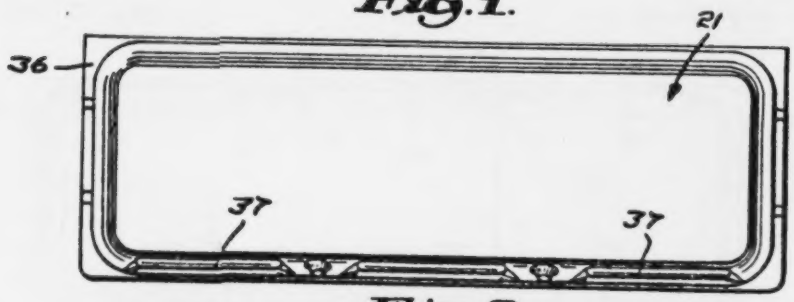


Fig. 2.

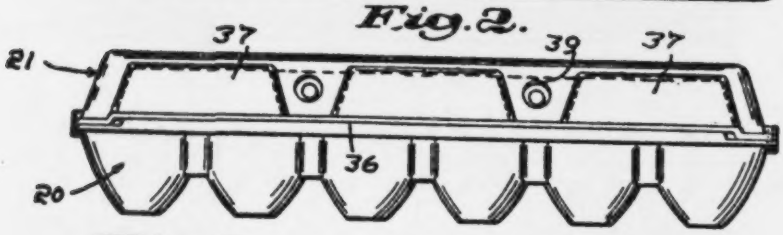


Fig. 3.

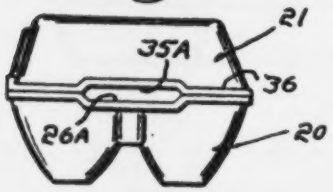


Fig. 10.

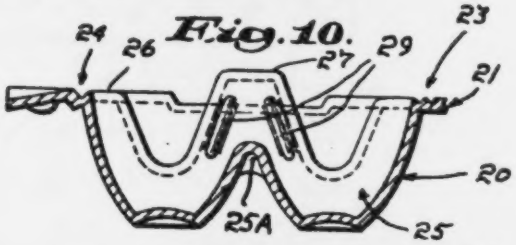


Fig. 11.

Fig. 12.

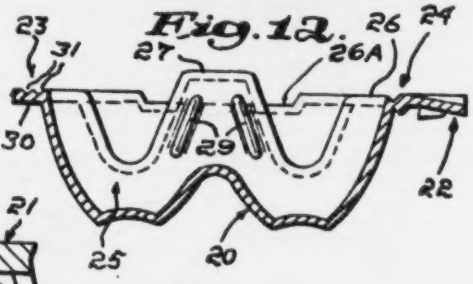


Fig. 13.

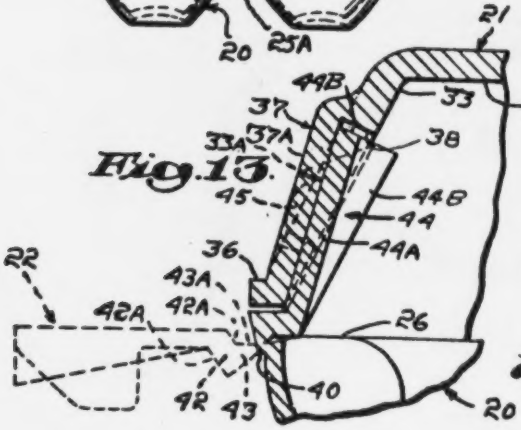


Fig. 6.

Inventors:
Gerald A. Snow
Harold A. Dingley
by Abbott Spear,
Attorney

Aug. 27, 1968 G. A. SNOW ET AL 3,398,875

EGG CARTONS

Filed Dec. 30 1966 3 Sheets-Sheet 2

Fig. 4.

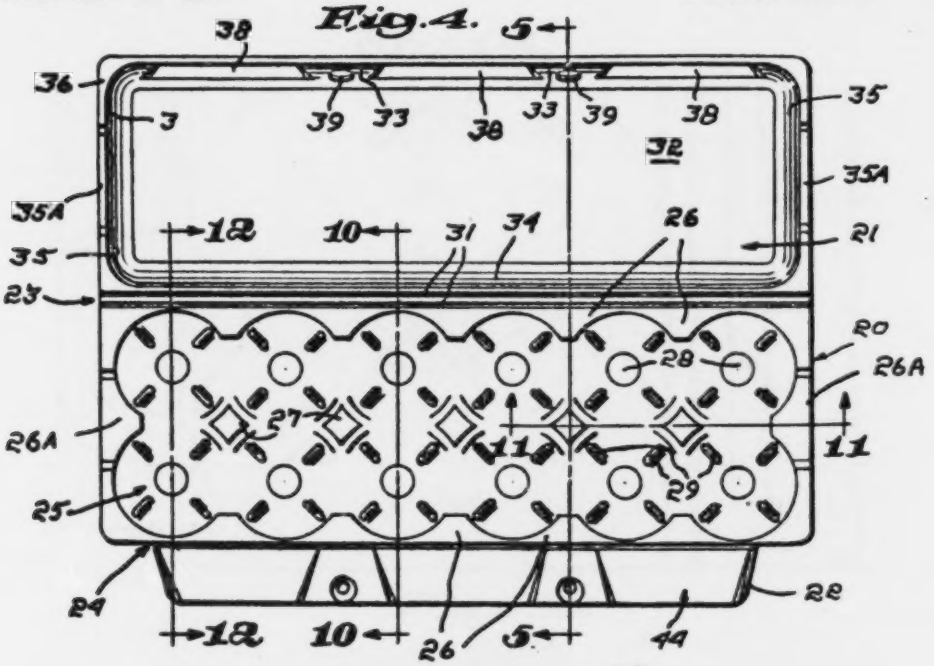


Fig. 5.

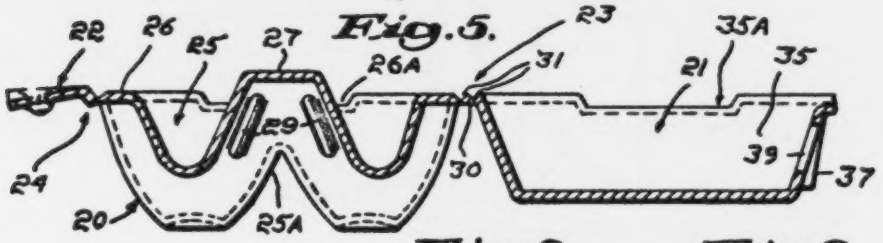


Fig. 8.

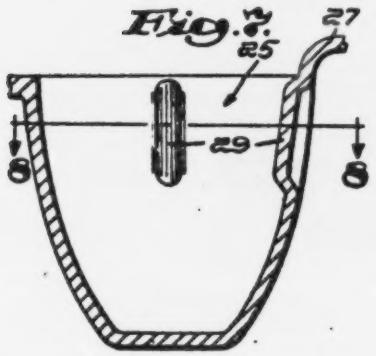
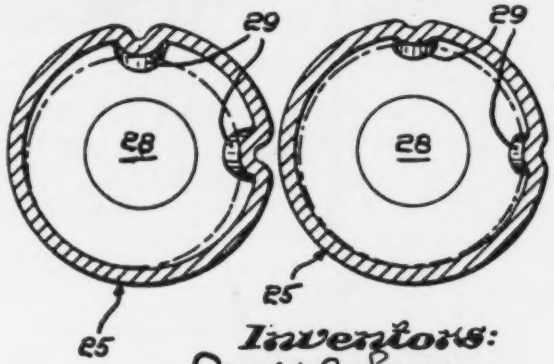


Fig. 9.



Inventors:
Gerald A. Snow
Harold A. Doughty
by Abbott Lowe
Attorney

Aug. 27, 1968 G. A. SNOW ET AL 3,398,875

EGG CARTONS

Filed Dec. 30, 1966 3 Sheets-Sheet 3

Fig. 14.

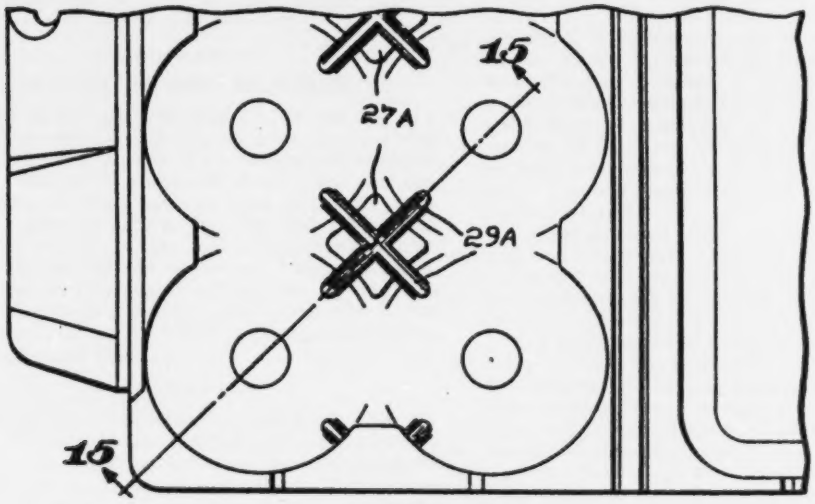


Fig. 15.

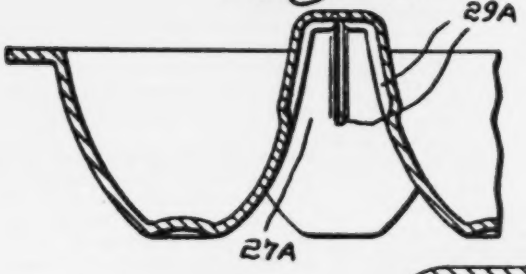
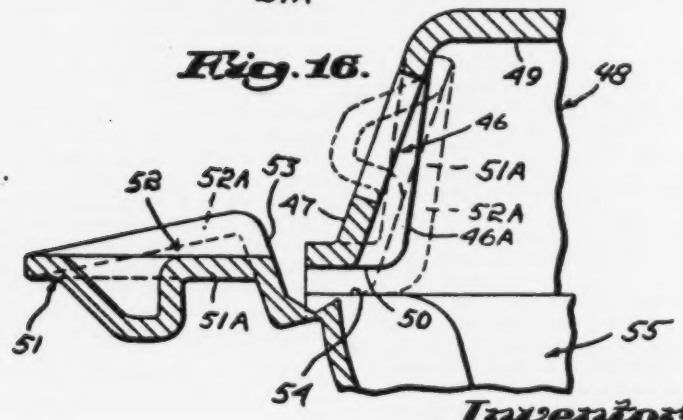


Fig. 16.



Inventors:
Gerald A. Snow
Hawley A. Doughty
By Allen Lowe
Attorney

United States Patent Office 3,398,875 Patented Aug. 27, 1968

3,398,875

EGG CARTONS

Gerald A. Snow, Cumberland Foreside, and Harold A. Doughty, Cape Elizabeth, Maine, assignors to United Industrial Syndicate, Inc., doing business as Portland Company Division of United Industrial Syndicate, Inc., Portland, Maine, a corporation of New York

Filed Dec. 30, 1966, Ser. No. 606,118
10 Claims. (Cl. 229—2.5)

ABSTRACT OF THE DISCLOSURE

Egg cartons having a cover hinged to the rear edge of a carton bottom and a locking flap hinged to the front edge thereof, the locking flap having a projection which extends through a hole in the front wall of the cover when the flap is positioned to underlie the front wall of the cover when the cover is closed, the flap and cover front wall having vertical channels establishing inner and outer wall portions, one set of wall portions being more nearly vertical than the other set of wall portions, together with a special flap hinge and with a cover front wall having seats internally of the cover front wall engageable by the upper edges of the flap.

The present invention relates to molded containers for articles needing protection of which eggs are but one example and the invention is herein discussed primarily with reference to egg carton embodiments. Cartons for such uses have a bottom formed with egg-receiving pockets, a cover integral with and hingedly connected to its rear edge, and a locking flap integral with and hingedly connected to the front edge of the bottom to fold upwardly and inwardly into an operative position in which it underlies the front wall of the cover when it is closed, the front wall of the cover and the flap including complemental interlocking portions that then become interengaged.

Other special-purpose containers have bottoms formed with article-receiving compartments and covers hingedly connected thereto. When these were formed of material that would otherwise be too flexible, the bottoms and covers have been reinforced by stiffening channels. The covers, when such containers were closed, were supported by the upper edges of the bottom and their edges were also seated on shoulders formed marginally thereof. Releasable means were commonly provided to lock the covers to the front wall of their container bottoms.

Egg cartons are made to nest and have their bottoms and tops of approximately the same depth. When molded from pulp or a plastic of about the same stiffness as pulp, no satisfactory connection directly between the carton bottoms and the covers is practicable. For that reason, locking flaps are used and considerable effort has been directed to the prevention of their becoming disengaged from the covers incidental to the handling and transportation of the cartons. Such locking flaps have also been used to brace the covers adjacent their junction with their front walls in the manner of such other special-purpose containers.

The present invention is concerned with the relationship of the locking flaps to the covers and particularly to the front walls thereof and also both to their connection with and their support by the carton bottoms.

In accordance with the invention, a carton has its locking flap and the front wall of its cover formed with vertically disposed reinforcements in the form of mating channels providing the inner and outer wall portions are so inclined relatively to each other that one set of wall portions is outwardly and downwardly inclined and the other set is more nearly vertical. Adjacent its front edge, the carton bottom includes shelf structure on which a marginal portion of the flap rests with the channel portions that are the more nearly vertical with respect thereto increasing the effectiveness of the reinforcements.

A preferred construction of the invention is to have the reinforcing channels of the front cover wall terminate substantially below its junction with the flat portion of the cover and to so dimension the locking flap that portions of it are engageable by the shoulders established on the interior surface of the front wall of the cover when the cover is closed. A particular objective of the invention is to have such flap portions and the seats with which they are engageable so inclined that downward pressure on the carton cover forces the locking flap and the front cover wall into such mutual contact that ensures that the means interlocking them do not become accidentally released.

Another preferred feature of an egg carton in accordance with the invention is the construction of the hinge integrally joining the locking flap to the carton bottom. In accordance with this feature, the flap has a shoulder provided with a tapering web connecting it with the front portion of the bottom at or adjacent it upper edge and defining the hinge line between it and the locking flap. The flap shoulder and the web include planar, angularly disposed surfaces. The front edge of the carton bottom has shelf structure and an outwardly and downwardly inclined marginal portion against which said planar flap portions seat when the locking flap is operatively disposed.

As problems exist in packing eggs above a predetermined size in any such carton, another objective of the invention is to provide egg-receiving pockets that are self-adjusting to a relatively wide, egg size range. In accordance with the invention, this objective is attained by providing each pocket with a channel that presents an internal, vertical rib within that pocket to be engaged by the egg that is seated therein. The ribs, and there are desirably two for each pocket, are preferably located where the pocket walls are so spaced from each other that the channels may flatten to expand a pocket without affecting any other pocket.

In the accompanying drawings, there are shown illustrative embodiments of the invention from which these and other of its objectives, novel features, and advantages will be readily apparent.

In the drawings:

FIGURE 1 is a top elevation of an egg carton in accordance with the invention,

FIGURE 2 is a front view thereof,

FIGURE 3 is an end view of the carton,

FIGURE 4 is a top elevation of the carton, the carton being shown as opened,

FIGURE 5 is a section taken approximately along the indicated lines 5—5 of FIGURE 4,

FIGURE 6 is a fragmentary section transversely of the hinge connection between the locking flap and the bottom of the carton,

FIGURE 7 is a vertical section, on an increased scale, through an egg-receiving pocket,

FIGURE 8 is a section taken approximately along the indicated lines 8—8 of FIGURE 7,

FIGURE 9 is a view similar to FIGURE 8 illustrating the expansion of the pocket by an egg,

FIGURES 10, 11, and 12 are sections taken, respectively, substantially along the indicated lines 10—10, 11—11, and 12—12 of FIGURE 4,

FIGURE 13 is a fragmentary, vertical section through the locking flap and the front wall of the cover of a closed carton,

FIGURE 14 is a fragmentary view of an open carton

in accordance with another embodiment of the invention,

FIGURE 15 is a section, on an increased scale, taken approximately along the indicated line 15—15 of FIGURE 14, and

FIGURE 16 is a view similar to FIGURE 13 but illustrating yet another embodiment of the invention.

The egg carton illustrated by the drawings comprises an egg-receiving and supporting bottom, a cover, and a locking flap, generally indicated at 20, 21, and 22, respectively. The cover 21 and the flap 22 are integrally joined to the back and front, respectively, of the carton bottom 20 by hinges generally indicated at 23 and 24, respectively.

The carton bottom 20 has a plurality of pockets generally indicated at 25, shown as arranged in two parallel rows of six pockets each. The outer portions of the walls of the pockets 25 are interconnected by outwardly extending webs or shelves 26, which establish the plane of the upper surface of the bottom 20 except centrally of its ends where the shelves are depressed as at 26A. Hollow posts 27, projecting above that plane, are so spaced between the two rows that each is common to and forms part of the wall of four pockets 25. Those parts 25A of the pocket walls between the posts 27 and between a post 27 and a shelf 26 or 26A terminate below the plane of the shelves 26. The wall structure 25A is common to two pockets 25 and is in the form of an inverted V. Elsewhere, the walls of adjacent pockets 25 are spaced apart.

Each pocket 25 is to support the lower portion of an egg and is generally egg-shaped but has a convex bottom 28. In order that the pockets 25 may serve to hold and support any egg whose dimensions are within an acceptably wide range, each pocket 25 is provided with a pair of inwardly disposed, vertical ribs 29, each shown as extending part way up each post 27 and, accordingly, spaced about 90° apart. In the case of the pockets 25 at the end of the carton tray 20, a rib 29 of each extends part way up its wall structure in the zone where the corresponding wall srtucture of two end pockets merge and form a shelf 26A. The ribs 29 are channels of U-shaped cross section with the channels of each row of pockets opening towards the other row. The ribs 29 present downwardly and inwardly inclined straight edges which are shown as terminating substantially above the bottom of each pocket to be engaged by an egg placed therein. While these ribs enable eggs within a substantial "undersize" range to be securely supported, the pocket wall thickness and the nature of the material from which the cartons are molded are such that the ribs 29 yield to effect the enlargement of any pocket that receives an egg whose pocket-entering portion is within a substantial "oversize" range.

A web 30 joins the cover 21 to the rear upper edge of the carton bottom 20, and has a pair of parallel V-shaped cuts 31 which establish the hinge 23. The cover 21 has a flat-surfaced top 32 and integral, outwardly and downwardly sloping front, rear, and end walls 33, 34, and 35, respectively, of a height such that when the cover 21 is in its carton-closing position, there is space for the upper portions of eggs seated in the pockets 25. The cover 21 has a marginal flange 36 and the end walls 35 are recessed as at 35A in a manner such that, when the cover 21 is closed against the bottom 20, the recesses 26A and 35A define slots ensuring ventilation from end-to-end of the carton.

The front wall 33 has a series of vertically disposed, generally indicated channels 37 which serve to stiffen it. In the embodiment of the invention illustrated by the drawings, there are three such channels and these are shown as of substantial width with upwardly and inwardly tapering ends and as tapering upwardly and outwardly from the flange 36 away from the wall 33 and as terminating a substantial distance below the junction of the wall 33 and the top 32 of the cover 21 thus to provide

transversely alined, internal shoulders or seats 38. In practice, the seats 38 are inwardly and downwardly inclined. Between each two channels 37 there is a locking aperture 39, the apertures being shown as circular. The channels 37 thus provide wall portions 37A that are more nearly vertical than the portions of the wall 33 between them, see FIGURE 13.

The shelves 26 along the front upper edge of the carton bottom 20 include a straight edged narrow outwardly projecting shoulder 40 having its front or outer edge presenting an outwardly and downwardly inclined margin 41, the angle of the margin 41 to the vertical being shown as in the neighborhood of 58°.

The locking flap 22 includes a shoulder 42 extending along its inner edge with the shoulder 42 having a web 43 integrally connected to the shoulder 40 and tapering to define the fold line of the hinge 24. The surfaces 42A and 43A are planar and disposed angularly relative to each other, the angle between them being approximately that defined by the margin 41 and the structure 26. The surface 43A is of approximately the same width as the margin 41 so that when the locking flap 22 is swung upwardly and inwardly into its operative position prior to the closing of the cover 21, the surfaces 43A and 42A engage and are supported, respectively, by the margin 41 and proximate portions of the shelves 26 at the front upper edge of the carton bottom 21. The surface 42B is parallel to the surface 42A and when the locking flap 22 is seated on the outer edge of the carton bottom 20, the surface 42B is parallel to and underlies the front wall 33 of the cover 21 and is engageable thereby when the cover 22 is positioned to close the carton.

The locking flap 22 includes vertically disposed reinforcing channels 44 of the same shape as the channels 37 of the cover front wall 32 and are shown as dimensioned to fit therein. The channels 44 taper downwardly and inwardly from the free end of the locking flap 22 and terminate adjacent the shoulder surface 42B thus to provide outer portions 44A, see FIGURE 13, that are more nearly vertical than the intermediate portions of the flap 22. The upper extremities 44B are engageable with the seats 38 and are so inclined that they interlock and, on downward pressure on the cover 21, the locking flap 22 and the front wall 33 are urged into tight mutually reinforcing relationship with the load favorably distributed relative to the vertical.

The locking flap 22 has locking projections 45, one for each aperture 39 of the cover front wall 33 and extending outwardly therethrough when the cover 22 is in its closed position to hold it against accidental release. The projections 45 do not protrude beyond the plane of the surfaces 37A of the reinforcements 37 which are preferably closely spaced to minimize the chances of the projection being accidentally released from the holes 39. Each locking projection 45, at its base and at its outer end is circular but its upper portion tapers downwardly and outwardly from the upper edge of the flap 22 while its lower portion projects outwardly at right angles to the flap portions 22A.

The embodiment of the invention shown in FIGURES 14 and 15 illustrates the reinforcement of the posts 27A by continuing the channels that establish the ribs 29A in the egg-receiving pockets upwardly along each post 27A and across the top thereof, each reinforcing rib 29A being common to diagonally spaced pockets.

In the embodiment of the invention illustrated by FIGURE 16, a different arrangement of the vertical and tapering channels providing reinforcements of the locking flap and of the front wall of the carton cover is shown.

In the egg carton shown in FIGURE 16, the channels 46 of the outwardly and downwardly inclined front wall 47 of the cover 48 are desirably narrow and project inwardly of and at an angle relative thereto to provide wall portions 46A that are approximately at right angles rela-

tive to the plane of the flat top wall 49 of the cover 48 and provide closed bearing ends 50.

The locking flap 51, while it may otherwise be similar to the locking flap 23, has its vertical, inwardly disposed channels by which it is reinforced, generally indicated at 52 and these are upwardly and inwardly tapered to have mating engagement with the channels 46 of the cover 48 and to provide approximately vertical inner wall portions 52A relative to which the remainder of the flap is outwardly and downwardly inclined when the flap 51 is operatively positioned with its seat 53 resting on the shelf structure 54 of the carton bottom 55 and engageable by the bearing ends 50 when the cover 48 is closed. The flap 51 is shown as having its free edge terminating well below the flat cover wall 49. The flap 52 has locking projections 56 disposed to enter aperture 57 in the front cover wall 47.

Egg cartons in accordance with the invention are well adapted to meet requirements since, once filled and closed, they resist accidental opening during handling and transit.

We claim:

1. A molded carton of the type comprising a bottom including front, rear and side walls and a plurality of article-receiving pockets, a cover including a flat top and depending front, side, and rear walls with at least the front cover wall being outwardly inclined, the rear cover and base walls being integrally and hingedly interconnected, and a locking flap integrally and hingedly connected to the front wall of said base to swing into and out of an upwardly disposed, inwardly inclined operative position in which it is in mutual contact with the rear face of the front cover wall when the cover is in its carton-closing position, said carton being characterized by the bottom including shelf structure extending along the front upper edge of the bottom, the flap including a portion resting on said shelf structure in the operative flap position, the flap and the front cover wall including vertically disposed channels, the channels of the front cover wall commencing adjacent its bottom edge and the channels of the flap commencing adjacent said flap portion, the channels establishing inner and outer sets of wall portions for both said cover front wall and said flap, the wall portions of said inner and outer sets being inclined relative to each other with the wall portion of one set being more nearly vertical than the other, means to lock at least one wall portion of the flap to the corresponding wall portion of the cover front wall, said means comprising a projection on the portion of the flap to be locked and the portion of the cover front wall to be locked having a hole through which the projection extends when the cover is closed with the flap in its operative position, at least some of the flap wall portions of both sets bracing said cover and resisting inward movement of the flap when the cover is in support of a load.

2. The molded carton of claim 1 in which the channels of the front cover wall terminate below the top of the cover to provide a series of longitudinally extending seats and the flap is dimensioned so that upper edges of its outer wall portions are engageable with the seats when the carton is closed.

3. The molded carton of claim 2 in which the seats and seat-engaging upper edges are inclined inwardly and downwardly whereby downward pressure on the cover when the carton is closed urges the locking flap and front cover wall together.

4. The molded carton of claim 1 in which the ou wall portions of the front wall of the cover and of locking flap are the more nearly vertical wall portio the channels of the front wall of the cover terminate low the junction of the front wall of the cover and top thereof to provide internal longitudinally extend seats, and the upper edges of the outer wall portions the locking flap are engageable with the seats when carton is closed.

5. The molded carton of claim 1 in which the in wall portions of the front wall of the cover and of locking flap are the more nearly vertical wall porti and, the lower ends of the channels of the flap de seats engageable by the lower ends of the channels the front wall of the cover.

6. The molded carton of claim 1 in which the apert is circular and the projection is circular at its extremi and includes outwardly and downwardly tapering up portions and a lower portion that is straight.

7. A molded carton of the type comprising a bott including front, rear and side walls and a plurality article-receiving pockets, a cover including a flat top depending front, side, and rear walls with at least front cover wall being outwardly inclined, the rear co and base walls being integrally and hingedly interc nected, and a locking flap integrally and hingedly c nected to the front wall of said base to swing into out of an upwardly disposed, inwardly inclined opera position in which it is in mutual contact with the rear of the front cover wall when the cover is in its car closing position, said carton being characterized by bottom including a horizontal shelf structure and an wardly and downwardly inclined margin along its fr edge and said locking flap including a shoulder an tapering web integrally connecting said shoulder and front portion of said bottom and defining with said fr portion a fold line enabling said flap to be swung and out of said upwardly disposed operative posit said flap shoulder and said web including planar porti then engaging, respectively, said inclined margin and sh and the opposite face of said flap shoulder being para to said shoulder and then being engageable by the bot edge of said front cover wall.

8. The molded carton of claim 1 in which the portions of the flap and cover front wall to be interloc are inner wall portions.

9. The molded carton of claim 1 in which the portions of the flap and cover front wall to be interloc are outer wall portions.

10. The molded carton of claim 1 in which the chan of the front cover wall terminate short of the junctio the front cover wall with the cover top wall and the l ing aperture of the front cover wall is in an inner portion and is located below the upper ends of channels.

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